IPS-360

SERVICE MANUAL

US Model
AEP Model
E Model

PYXIS

SPECIFICATIONS

Physical Characteristics

Dimensions

	100 × 175 × 39 mm (W × H × D)
Receiver (antenna)	ø100 × 35 mm
Keyboard/Display	100 × 63 × 39 mm (W × H × D)

Weight

About 590 g (include 4 AA batteries)*
*Supplied only with the tourist model.

Display

2-Line, 40-Characters (20 × 2)

Operating Environment

Water	Receiver (antenna): Splash-proof
	Keyboard/Display: Drip-Proof
Operating Temperature	Receiver: −20°C ~ +60°C
	Keyboard/Display: −10°C ~ +50°C*

Electric Characteristics

Reception

1575.42 MHz, C/A Code
4 channel (parallel)
Sensitivity: −130 dBm

Power Requirements

R6 AA alkaline batteries × 4 (DC 6 V)
Battery life: about 100 minutes
CAR battery cord DCC-360P (DC 12/24 V)

Data Characteristics

Accuracy

Position: 30 ~ 100 m with DOP* ≤ 6
Velocity: 0.3 knots with DOP ≤ 6 (0.56 km/h)
*DOP = Dilution of Precision

Data renewal

3 seconds

Operational Characteristics

Max velocity

530 knots (980 km/h)

Memory Capacity

50 way points, 50 destinations (Register 9 roots)

Supplied Accessories

Car battery cord DCC-360P
Car battery socket DCC-360S
Antenna extension cable
Carrying strap
Carrying case
Mounting hardware (1 set)
Size AA (B6) alkaline batteries (4)*
*Supplied only with the tourist model.
Operating instructions

GPS(Global Positioning System) RECEIVER

SONY®

MICROFILM

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CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the eqipment manufacturer. Discard used batteries according to manufacturer's instructions.

ADVARSEL!

Lihiumbatteri — Eksplosionfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri
af samme fabrikat og type.
Lever det brugte batteri tilbage til leverandøren.

ADVARSEL

Lithiumbatteri — Eksplosjonsfare.
Ved utskifting benyttes kun batteri som
anbefalt av apparatfabrikanten.
Brukt batteri returneres apparatleverandøren.

VARNING

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent
typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens.
instruktion.

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan
tyypiin. Hävitä käytetty paristo valmistajan ohjeiden
mukaisesti.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

SECTION 1
GENERAL

This section is extracted from instruction manual.

Features

What is GPS (Global Positioning System)?

What is GPS?

The United States Department of Defence has launched 24 GPS satellites around the globe. While these are mainly for military purposes, some are available for civilian use. The 24 satellites are identified by the numbers. This unit automatically selects 4 GPS satellites and receives the GPS radio signals from those 4 GPS satellites. By using this unit, you can determine your exact latitude, longitude and altitude:
— anywhere in the world, at sea, on land or in the air,
— with measuring accuracy of 30 m – 100 m* in location and 10^{-4} seconds in time.

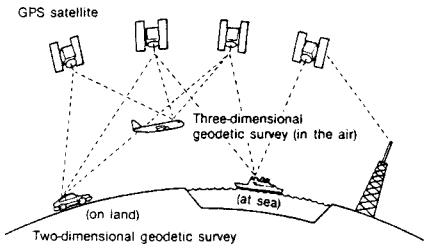
*The GPS satellites are managed by the US Department of Defence and the accuracy is subject to change.

How to determine your position with GPS

- GPS determines latitude, longitude and altitude by defining the whole earth as an ellipsoid which revolves on its axis. This system is called WGS (World Geodetic System) coordinate system.
- Latitude, longitude and altitude of a conventional world atlas are determined by a coordinate system in which the ellipsoids have different centers for each area.
- This unit displays the latitude and longitude determined by the WGS coordinate system which use a single coordinate system for the world. **Therefore, the latitude and longitude displayed in this unit may not be identical with those found in an atlas.** (See page 51 "Setting latitude and longitude to a chart")
- GPS determines the bearing from the true bearing, not by the compass bearing.

GPS system

- GPS satellites
  6 orbits × 4 satellites = 24 satellites (including spare satellites)
- Ground control station to trace and control the GPS satellites
- GPS receiver for each satellite



GPS system specifications

Satellite altitude: About 20000 km
Satellite orbit: About a 12-hour-cycle elliptical orbit

Signal format:
P code signals are used for the military purposes and C/A code signals are used for the civilian purposes. The unit tunes itself to the C/A code signals.

C/A code:

Frequency	1575.42 MHz
Clock	1.023 Mbps
Orbit data speed	50 bps
Signal strength	– 166 dBw

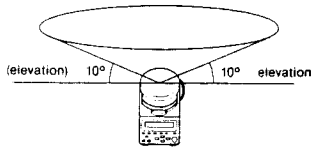
Modulation: Direct sequence

Introduction

Precautions (Important)

Notes on Tuning to the GPS Satellites

- **It is not possible to receive the GPS satellite signals indoors. Be sure to install the antenna outdoors with no obstructions in every direction and horizontally to the ground. (See page 11 "Antenna connection".)**
- **The GPS satellite is a moving satellite so the satellite may become located horizontally (low elevation) to the unit. In such cases, reception may become disturbed because of building or other obstructions.**



Please Wait

It takes about 30 minutes for the unit to receive the data from the GPS satellite and determine the location when:
- **you use the unit for the first time**
- you have not used the unit for long time and the data in the memory have become too old*
- you use the unit after you have moved a long distance (to abroad, for example) with this unit turned off.*

Note that it may take more than one hour according to the receiving condition.

*In these cases, you have to initialize the unit before using the unit again.
To initialize the unit, follow the steps below.

1 Press the POWER button to turn on the unit.

2 Press the SET button.

3 Press the △/▽ buttons to select "INITIALIZE GPS RCV." display.

4 Press the ENTER button.
"CLEAR/RECALL" display appears.

5 Press the CLEAR button.
The unit is now initialized.

On the DC IN 6V jack

Do not put anything in the DC IN 6V jack.

On Mechanical Vibration or Shock

Do not expose the unit to mechanical vibration or shock. This may cause malfunction.

On Maintenance

Clean the unit with a soft cloth. Do not use any type of solvent such as alcohol or benzine.

On Installation

Never put the unit:
— in direct sunlight or near heat sources
— in a car parked in the sun (especially in the summer)
— near strong magnets or speakers
— in a dusty place.

Note on the LCD (liquid crystal display)

As this unit uses an LCD, do not expose the unit to:
— direct sunlight or ultraviolet rays for a long time (such as at a beach in the summer)
— more than 50°C of ambient temperature or less than – 10°C. In a very high ambient temperature, the display may get darker. In a very low ambient temperature, the display changes slowly. (The display will return to normal condition under the proper operating temperature.)
— high humidity (such as in a bathroom). The LCD capability may deteriorate and a malfunction may occur.

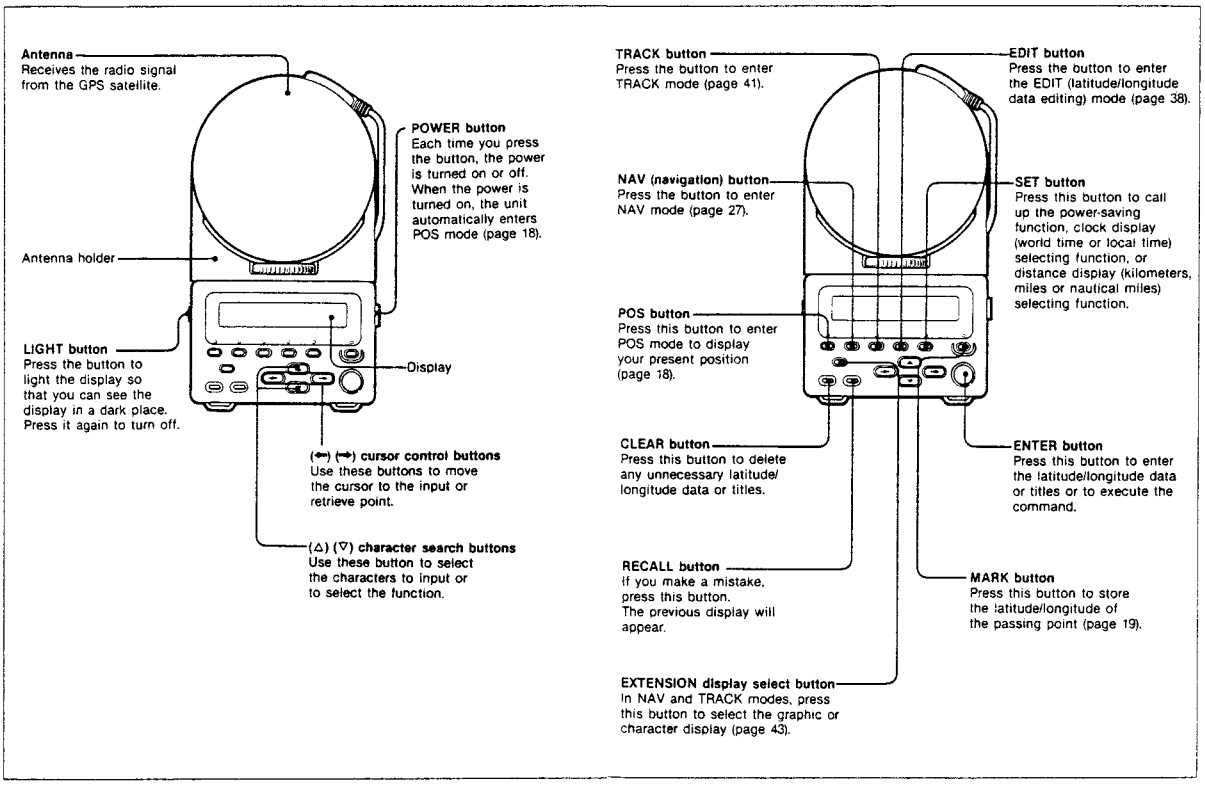
On Safety

Should any solid object or liquid fall into the unit, disconnect the power source and have the unit checked by qualified personnel before operating it any further.

Precautions

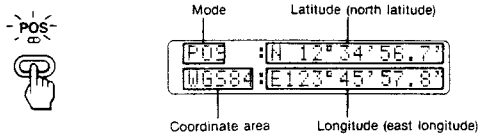
Introduction

Location and Function of Parts and Controls

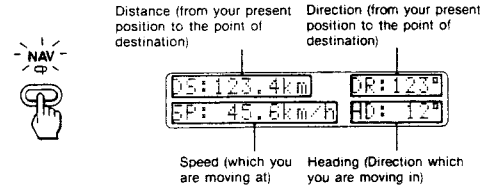

Antenna
Receives the radio signal from the GPS satellite.
POWER button
Each time you press the button, the power is turned on or off. When the power is turned on, the unit automatically enters POS mode (page 18).
Antenna holder
LIGHT button
Press the button to light the display so that you can see the display in a dark place. Press it again to turn off.
Display
(←) (→) cursor control buttons
Use these buttons to move the cursor to the input or retrieve point.
(△) (▽) character search buttons
Use these button to select the characters to input or to select the function.
TRACK button
Press the button to enter TRACK mode (page 41).
EDIT button
Press the button to enter the EDIT (latitude/longitude data editing) mode (page 38).
NAV (navigation) button
Press the button to enter NAV mode (page 27).
SET button
Press this button to call up the power-saving function, clock display (world time or local time) selecting function, or distance display (kilometers, miles or nautical miles) selecting function.
POS button
Press this button to enter POS mode to display your present position (page 18).
CLEAR button
Press this button to delete any unnecessary latitude/longitude data or titles.
ENTER button
Press this button to enter the latitude/longitude data or titles or to execute the command.
RECALL button
If you make a mistake, press this button. The previous display will appear.
MARK button
Press this button to store the latitude/longitude of the passing point (page 19).
EXTENSION display select button
In NAV and TRACK modes, press this button to select the graphic or character display (page 43).

How to Read the Display

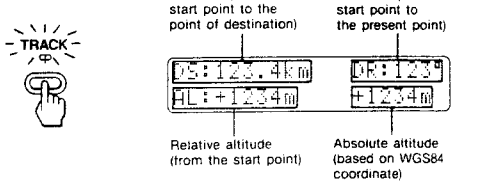
POS mode



NAV mode


NAV
Distance (from your present position to the point of destination)
Direction (from your present position to the point of destination)
DS:123.4km
DR:123°
SP: 45.6km/h
HD: 12°
Speed (which you are moving at)
Heading (Direction which you are moving in)

TRACK mode

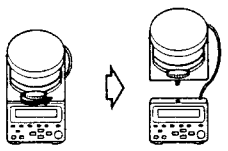

TRACK
Distance (from the start point to the point of destination)
Direction (from the start point to the present point)
DS:123.4km
DR:123°
AL:+1234m
+1234m
Relative altitude (from the start point)
Absolute altitude (based on WGS84 coordinate)

Antenna Connection

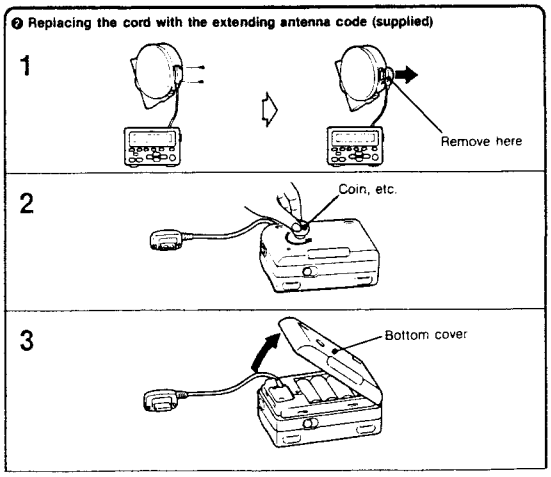
Installing the Antenna apart from the Unit

Using the extending antenna code (supplied), you can install the antenna about 7 meters apart from the unit.

❶ Disconnecting the antenna



❷ Replacing the cord with the extending antenna code (supplied)



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Antenna Connection

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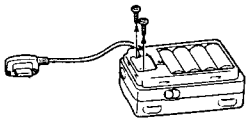
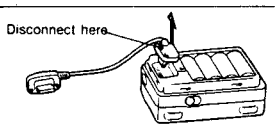
4

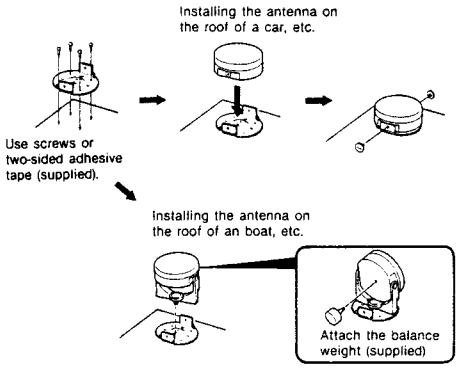


5



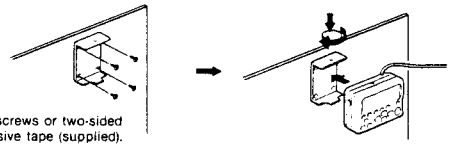
6 Connecting the extending antenna cord is the reverse of disconnection.

❸ Installing the Antenna


Installing the antenna on the roof of a car, etc.
Use screws or two-sided adhesive tape (supplied).
Installing the antenna on the roof of an boat, etc.
Attach the balance weight (supplied)

❹ Installing the unit

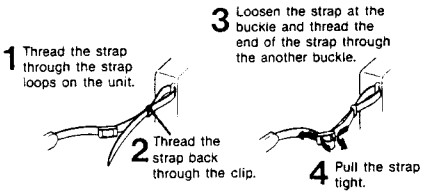
Install the unit on the wall of a car (inside) or an boat cabin, etc.



Note

If the antenna is disconnected from the unit, "•NO ANT. UNIT•" appears in the display. The latitude and longitude of your present position do not appear. Make sure that the antenna code is firmly connected during navigation.

Attaching the shoulder strap


1 Thread the strap through the strap loops on the unit.
2 Thread the strap back through the clip.
3 Loosen the strap at the buckle and thread the end of the strap through the another buckle.
4 Pull the strap tight.

Power Sources

Operating the unit on DC 6 V

Battery*	4 size AA (R6) alkaline batteries
Boat or car battery	Use the supplied car battery cord DCC-360P (for 12/24 V car)

*Supplied only with the tourist model.

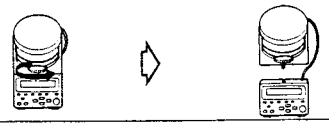
Note

- The unit uses the alkaline battery power to store the latitude/longitude data in memory. **Keep the alkaline batteries installed in the unit,** even when operating the unit with a boat or car battery.
- The memory in the receiver (antenna) is kept by the lithum battery. The battery life is about five years.

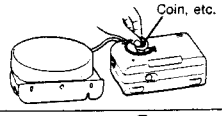
Using on the Battery

How to insert the batteries

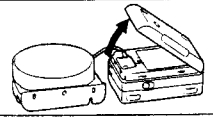
1



2



3



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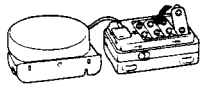

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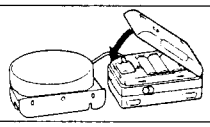
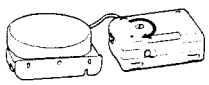
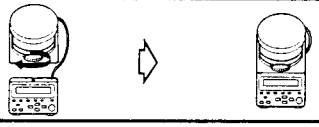


6



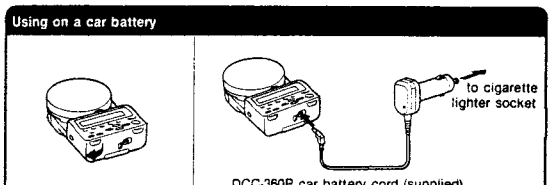
7



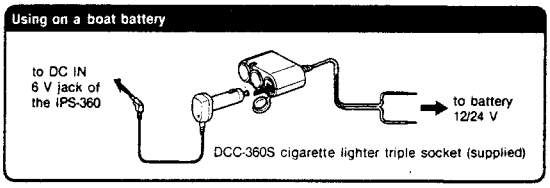
If the voltage decreases during operation

If the voltage becomes less than 4.5 V during operation, "•BATTERY LOW•" appears in the display. Turn off the power and change the battery as soon as possible.

Using on a car battery

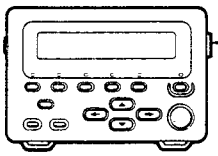


Using on a boat battery

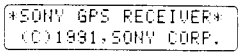


When You Begin Using This Unit

The unit retains the last location of the GPS satellite from which the unit can receive a signal in the area. Using the orbital data, the unit can determine your present position quickly.
In the initial mode (without any orbital data), "INIT" appears in the display and it takes the unit about 30 minutes to memory the orbital data ("INIT" disappears).
When you use the unit for the first time, or whenever you see "INIT" in the display, follow the steps below to store the receivable GPS satellite data for the area.



Press the POWER button to turn on the unit.
While the unit receives the GPS satellite signal and determines the latitude and longitude of the present position, the display changes in the following sequence.



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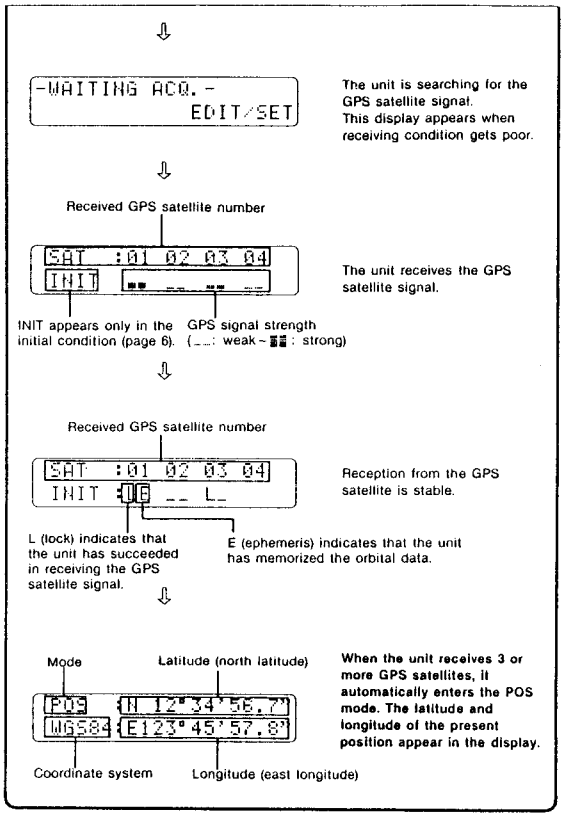
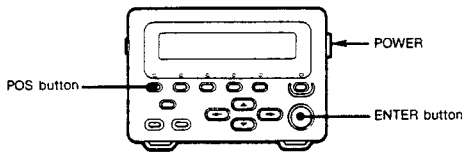

-WAITING ACQ.-
EDIT/SET
The unit is searching for the GPS satellite signal. This display appears when receiving condition gets poor.
Received GPS satellite number
SAT :01 02 03 04
INIT
The unit receives the GPS satellite signal.
INIT appears only in the initial condition (page 6).
GPS signal strength (_ _: weak ~ ■ ■ : strong)
Received GPS satellite number
SAT :01 02 03 04
INIT
Reception from the GPS satellite is stable.
L (lock) indicates that the unit has succeeded in receiving the GPS satellite signal.
E (ephemeris) indicates that the unit has memorized the orbital data.
Mode
Latitude (north latitude)
POS
N 12°34'56.7"
WGS84
E123°45'57.8"
When the unit receives 3 or more GPS satellites, it automatically enters the POS mode. The latitude and longitude of the present position appear in the display.
Coordinate system
Longitude (east longitude)

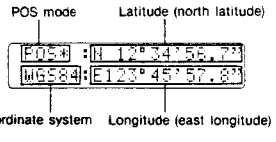
Operation

Checking the Present Position —POS (position) mode

You can check where you are by the latitude and longitude which appears in the display.



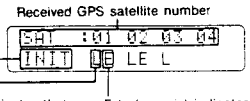
Press the POS button.
The latitude and longitude of your present position appear. If you see "INIT" in the display, the unit is in the initial mode. See page 16 "When you begin using this unit".



In the POS mode, "*" appears whenever the unit renews the latitude and the longitude data. "?" appears when the data precision is poor. See "Setting the Positioning Precision" (page 58) for details.

Checking the reception status from the GPS satellite

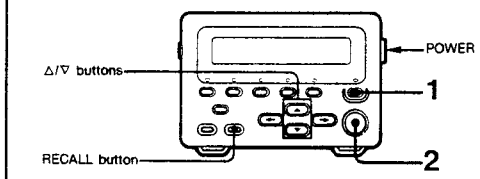
Press the ENTER button while your present position appears in the POS mode.



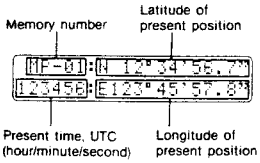
INIT (initial) appears when the orbital data is not stored in the memory.
L (lock) indicates that the unit has succeeded in receiving the GPS satellite signal.
E (ephemeris) indicates that the unit has the orbital data of the GPS satellite in memory.

Storing Your Present Position

After displaying your present position, you can store the latitude and longitude data in the MP (mark point) memory numbers. You can store up to 50 points.
Store the data for each major point that you pass:
— to find the point again
— to use as the intermediate point in the NAV (navigation) mode.



1 **Press the MARK button.**
The unit displays the present position and time (UTC). The unit redies itself for data input.



2 **Press the ENTER button.**
The data in the display were stored.

When you do not want to store the data

Press the RECALL button.
The previous display appears.

Checking the Present Position (POS mode)

If you cannot store the data

To cancel storing
When "MEMORY FULL!" is in the display, press the RECALL button.

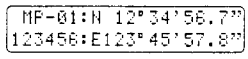
To delete unnecessary data and store new data

1 When "MEMORY FULL!" is in the display, press the ENTER button.

2 Select the memory number of the unnecessary data with △/▽ buttons.

3 Press the ENTER button.

4 Press the ENTER button. (If you do not wish to delete the data, press the RECALL button and select another memory number.)



You cannot delete the latitude/longitude data being in the NAV mode. If you try to delete it, "DATA IN USE!" appears. If this happens, press the RECALL button and go to step 2 and select another latitude/longitude data to delete.

5 Press the ENTER button.
The latitude/longitude data in the memory number selected in step 2 is deleted and the latitude/longitude data of your present position is stored in the memory number.

Checking the Distance and Direction to your Destination—NAV (navigation) mode

When you know:
— the direction and distance from the present position to the points of destination
— absolute velocity (the speed you are moving at)
the unit will navigate for you

(Continued)

Checking the Distance and Direction to your Destination —NAV (navigation) mode

(Continued)

Navigation steps
The following steps are required for navigation. See the following pages for operation procedure.

1 Decide the destination and route referring to a map, etc.

2 Store the latitude/longitude data (WP (way point)) of the points of destination. (page 23)

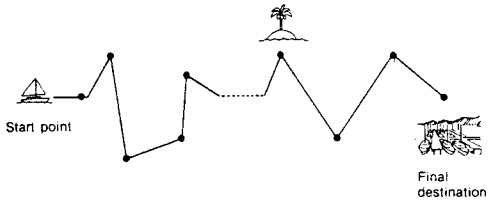
3 Plan your route in accordance with the WP and MP and store the data. (page 26)

4 Confirm and revise the route. (pages 30, 31)

5 Start navigation. (page 33)

What are the WP and the MP?
WP (way point): The latitude and longitude of the points of destination. Enter and store these data in the unit. (see page 23 to store the WP.)

MP (mark way point): The latitude and longitude that are stored when you passed the point. Press the MARK, and Enter button to store the data (see page 19).



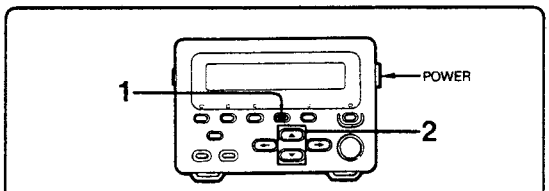
Navigation concept

• mark: the point you are planning to pass

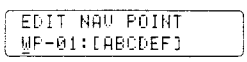
Storing the Latitude/Longitude Data of the Points of Destination

(To change the latitude/longitude data or titles, see page 40.)

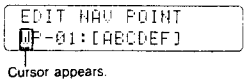
You can store the latitude/longitude data of up to 50 points of destination in the memory numbers called WP (way point). Also, you can store the latitude/longitude data with a title of up to 6 characters. We recommend storing the data of the final destination and important intermediate points with a title, for example the name of a town.



1 **Press the EDIT button.**
The unit enters the latitude/longitude data edit mode.



2 **Press the △ or ▽ button to select WP.**

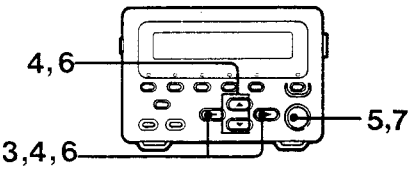


Cursor appears.

(Continued)

Checking the Distance and Direction to your Destination—NAV (navigation) mode

(Continued)



3 **Press the ← or → button to move the cursor to the first character.**

```
EDIT NAV POINT
WP-01:[ABCDEF]
```

4 **Enter the title using the ←, →, △, and ▽ buttons.**
To advance/reverse the characters, press the △/▽ buttons.
To move the cursor back and forth, press the ←/→ buttons.

```
EDIT NAV POINT
WP-01:[HARBOR]
```

5 **Press the ENTER button.**
The unit is in latitude/longitude input mode.

```
WP-01:N 00°00'00.0"
HARBOR:E000°00'00.0"
```

6 **Enter the latitude and longitude using the ←, →, △, and ▽ buttons.**
To advance/reverse the number, press the △/▽ buttons.
To move the cursor back and forth, press the ←/→ buttons.

```
WP-01:N 12°34'56.7"
HARBOR:E123°45'57.8"
```

7 **Press the ENTER button.**
The latitude/longitude data are stored.

To store additional latitude/longitude data for WP

Repeat steps 4 to 7.
We recommend storing some intermediate points.

If you cannot store

"MEMORY FULL!" appears in the display. Cancel storing or delete unnecessary data.

To cancel storing
While "MEMORY FULL!" is displayed, press the RECALL button.

To delete unnecessary data and store new data

1 While "MEMORY FULL!" is displayed, press the RECALL button.
2 Select the memory number of the unnecessary data with the △/▽ buttons, and press the ENTER button.
3 Move the cursor to the title with the ←/→ buttons.
4 Press the CLEAR button.
The title disappears.
5 Press the ENTER button.
"DELETE? ENTER/RECALL" appears.

You cannot delete the latitude/longitude data being used for navigation. If you try to do so, "DATA IN USE!" appears. If this happens, press the RECALL button and select another latitude/longitude data to delete.

6 Press the ENTER button.
The latitude/longitude data in the memory number selected in step 2 has been deleted. Store the new latitude/longitude data in the memory number.

Characters you can use for titles

As you press the △/▽ button, letters, numbers, and symbols appear in the following order:

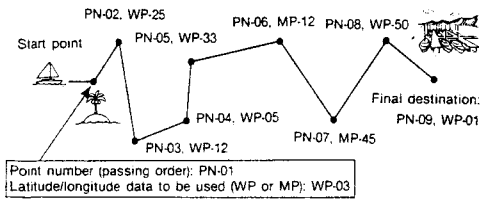
Press the ▽ button. ← Press the △ button. →

(blank) ABC···XYZ012···789 ( ) < > + − * / = ' , . : ; !?#¥$%&

Checking the Distance and Direction to Your Destination—NAV mode

Planning the Route to Your Destination

Plan the route according to the final destination and intermediate points. To plan the route, first select the route. Then, select the memory number called PN (point number) which indicates the order of points to be passed. Finally, select an intermediate point from the stored WP or MP latitude/longitude data and store it in the selected PN memory number.



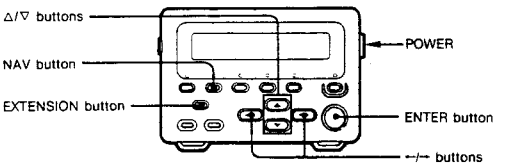
Example of a route with 8 intermediate points —Route 1 (RT-[1])

You can plan up to 9 routes with this unit. You can store up to 99 WP/MP including the final destination for a route. When you plan all 9 routes, you can store a total of 99 points.

Steps to plan a route
See the following pages for operation procedure.

❶ Select a route. (page 27)
❷ Select a PN. (page 28)
❸ Select a WP/MP and store it in PN. (page 28)

Repeat steps 2 and 3 to complete the routing. (page 29)



❶ Selecting a route number

1 **Press the NAV button.**
The unit enters the NAV mode.

```
NAV PLAN
■EDIT
```

2 **Press the △/▽ buttons until EDIT appears.**
Each time you press the △/▽ buttons, the display changes in the following sequence.
⌐EDIT↔SELECT↔ON/OFF┐

```
NAV PLAN
■EDIT
```

EDIT display

3 **Press the ENTER button.**
The route number appears.

```
EDIT NAV ROUTE
RT-[1]
```

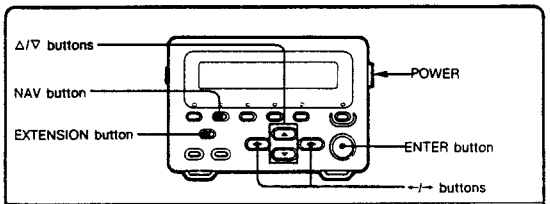
Route number

4 **Press the △/▽ button to display the route number.**
To advance/reverse the route number, press the △/▽ buttons.

5 **Press the ENTER button.**
The navigation plan appears.

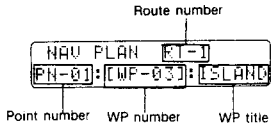
```
NAV PLAN  RT-1
PN-01:[WP-03]:ISLAND
```

Checking the Distance and Direction to Your Destination— NAV mode

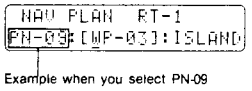


❷ Selecting a PN (point number)

1 **Select the route number. (page 27)**
If the route number is selected already, go to step 2.



2 **Press the Δ/▽ button to display the point number.**

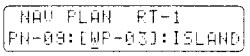


❸ Storing the WP or MP to the point number

1 **Select the route number. (page 27)**
If the route number is selected already, go to step 2.

2 **Select the point number. (see the section "Selecting a PN" above.)**
If the point number is selected already, go to step 3.

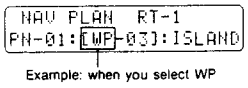
3 **Press the ←/→ button to move the cursor to the WP or MP.**



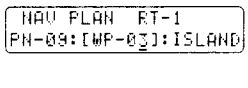
(Continued)

(Continued)

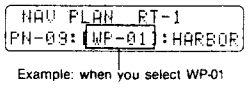
4 **Press the Δ/▽ button to display WP or MP.**
Each time you press the Δ/▽ button, WP and MP appear alternately.



5 **Press the ←/→ button to move the cursor to the WP (or MP) number.**



6 **Press the Δ/▽ button to display the WP (or MP) number.**



To check the latitude/longitude data of the selected WP (or MP) number
Press the EXTENSION button. The latitude/longitude data appear. To return to the display in step 6, press the EXTENSION button again.

7 **Press the ENTER button.**
The latitude/longitude data of the WP (or MP) number are stored in the point number.

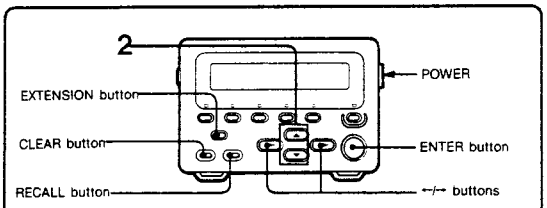
To select another point number, go to step 2 of the section "Selecting a PN" (page 28).

To select another route number, go to step 1 of the section "Selecting a route number" (page 27).

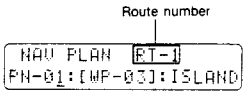
Checking the Distance and Direction to Your Destination— NAV mode

Checking the Route

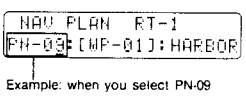
You can check the latitude/longitude data for the intermediate points on the route you have planned. Check the latitude/longitude data before navigation in order to navigate more accurately.



1 **Select the route to be checked. (See "Selecting a route number" on page 27.)**



2 **Press the Δ/▽ button to display the point number to be checked.**



When you want to check the data for the point number you have selected
Press the EXTENSION button. The latitude/longitude data appears. To return to the display of step 2, press the EXTENSION button again.

Changing an intermediate point

1 Select the route to be changed. (See "Selecting a route" on page 27.)

2 Press the ←/→ button to move the cursor to the PN number.

3 Press the Δ/▽ button to display the PN number to be deleted.

4 Press the CLEAR button.

5 **To delete the intermediate point,** press the ENTER button.
To cancel deleting, press the RECALL button.

To delete an intermediate point
Follow the above steps 2 to 5.

Example: When you want to delete WP-12 and MP-45

PN-01:WP-03	PN-01:WP-03
PN-02:WP-25	PN-02:WP-25
PN-03:WP-12	PN-03:MP-05
PN-04:MP-05	PN-04:WP-33
PN-05:WP-33	⇩
⇩	PN-95:MP-12
PN-96:MP-12	PN-96:WP-50
PN-97:MP-45	Final destination: PN-97:WP-01
PN-98:MP-50	
Final destination: PN-99:WP-01	

When a memory number is deleted from a point number, the next memory number is stored in that point number.

If you try to delete an intermediate point being used for navigation
"DATA IN USE!" appears. Press the RECALL button to return to the previous display. Then select the data to be deleted again.
Be sure to turn off NAV mode (page 35) before you delete the data.

Checking the Distance and Direction to Your Destination—NAV mode

Checking the Route (continued)

To add an intermediate point

1 Select the route number to be changed. (See "Selecting a route number" on page 27.)

2 Press the ←/→ button to move the cursor to the PN number.

3 Press the △/▽ button to display the PN number prior to the point you want to add.
Example: When you want to add PN-03, select PN-02.

4 Press the ←/→ button to move the cursor to the WP (or MP) number.

5 Press the △/▽ button to display the WP (or MP) number to be added.

6 Press the ENTER button.
The latitude and longitude of the newly selected WP (or MP) number is stored in the PN number next to the PN number you selected in step 3.

Example: When you want to add WP-12 to PN-03 and MP-45 to PN-97

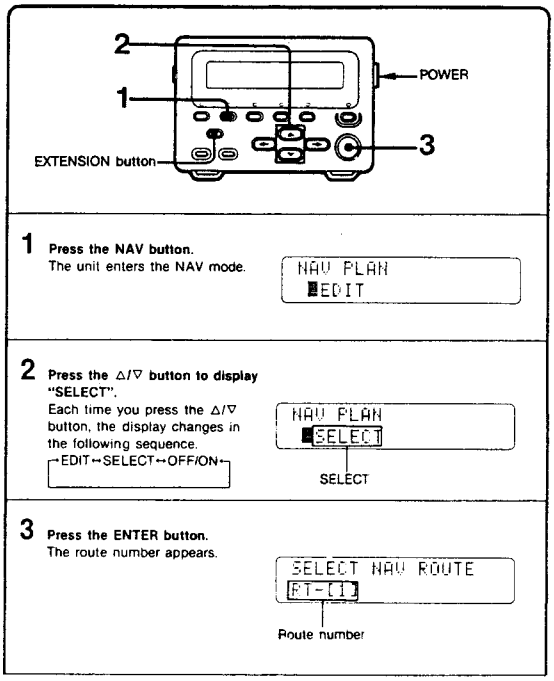
PN-01:WP-03	PN-01:WP-03
PN-02:WP-25	PN-02:WP-25
PN-03:MP-05	PN-03:WP-12
PN-04:WP-33	PN-04:MP-05
.	PN-05:WP-33
.	.
.	.
PN-95:MP-12	.
PN-96:WP-50	PN-96:MP-12
Final destination: PN-97:WP-01	PN-97:MP-45
	PN-98:WP-50
	Final destination: PN-99:WP-01

When an intermediate point is added, the WP (or MP) number at that point number is stored in the next point number.

If you try to store more than 99 passing points in a route
"MEMORY FULL!" appears and the data is not stored. Press the RECALL button. Or leave it as it is until the display returns to the previous display after a few seconds. After deleting an unnecessary intermediate point in memory, store the new one.

Displaying the Direction and Distance to Your Destination —Starting Navigation

The unit shows which direction and how long you must go to reach an intermediate point or the final destination along the route. The unit notifies you with the display and sound that you are close to an intermediate point or the final destination.



1 Press the NAV button.
The unit enters the NAV mode.

2 Press the △/▽ button to display "SELECT".
Each time you press the △/▽ button, the display changes in the following sequence.
┌EDIT↔SELECT↔OFF/ON┐

SELECT

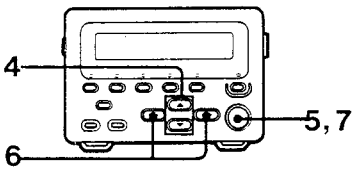
3 Press the ENTER button.
The route number appears.

Route number

(Continued)

Checking the Distance and Direction to Your Destination—NAV mode

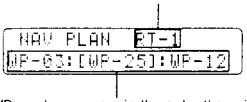
(Continued)



4 Press the △/▽ button to display the route number to be navigated.
To advance/reverse the route number, press △/▽ button.
Only the route numbers stored appear.

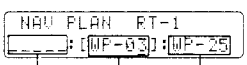
5 Press the ENTER button.
The navigation plan appears.

Route number



The WP numbers appear in the order the point numbers were stored. (see page 26.)

6 Press the ←/→ button to display the point of destination (navigation point).
To advance/reverse the navigation point, press →/← button.



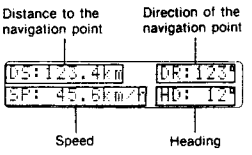
Previous navigation point (For the route example on page 26, this is the start point.) | Present navigation point | Next navigation point

To check the data of the selected point number
Press the EXTENSION button. The latitude/longitude and title appear. To return to the display in step 6, press the EXTENSION button again.

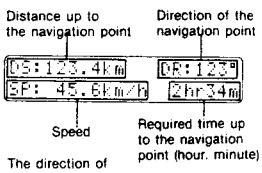
(Continued)

(Continued)

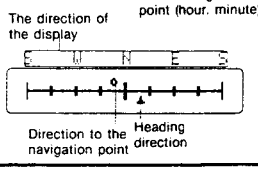
7 Press the ENTER button.
The unit starts navigation and displays the navigation data.



To display the required time up to the navigation point, press the ▽ button.
Each time you press the △/▽ button, the navigation data or required time appear alternately.

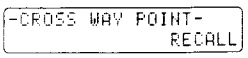


To change to the graphic display, press the EXTENSION button.
Each time you press the EXTENSION button, the navigation data or the graphic data appear alternately.



When you arrive at the navigation point

The following display appears with the beep sounding 10 times.



To return to the navigation data display

Press the RECALL button.
The navigation data for the next navigation point (WP-25 for the route example on page 26) appears and remains.

To turn off the NAV mode

Select "OFF" in step 2 (page 33).

Checking the Distance and Direction to Your Destination—NAV mode

Setting the radius where the unit starts notifying you of arrival at a navigation point—Cross way point function

When you arrive at the navigation point, the unit alerts you by beeping. The display also changes. You can set a radius around the navigation point, so that the unit will aleart you as you approach the navigation point.

1 **Press the SET button.**

```
SET
▮POWER SAVE
```

2 **Press the △/▽ button to display "CROSS WAY POINT!".**
Each time you press the ▽/▽ button, the display changes in the follows sequence.
POWER SAVE↔CROSS WAY POINT↔TIME DIFFERENCE↔GEODETIC SYSTEM↔LENGTH UNIT↔DIRECTION↔POS. PRECISION↔INITIALIZE GPS REV.↔POWER SAVE

```
SET
▮CROSS WAY POINT
```

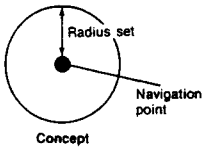
3 **Press the ENTER button.**
The radius used in the cross way point function appears. The length unit is the one you have selected: kilometer, mile, or nautical mile.

```
CROSS POINT ZONE
    300 m
```

(Continued)

(Continued)

4 **Press the △/▽ button to select the radius you want.**



Concept

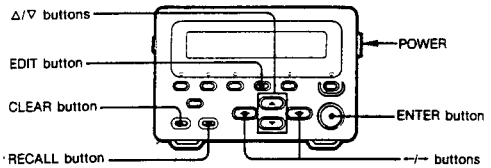
Length unit	▽ button←					→△ button	
Meter	300	500	1000	2000	5000	9000	m
Land-mile	0.20	0.30	0.60	1.30	3.10	5.60	mile
Sea-mile	0.20	0.30	0.50	1.00	2.70	4.90	nmile

5 **Press the ENTER button.**
When you enter the zone defined by the set radius, the unit alerts you by beeping. The unit also displays "CROSS WAY POINT."

Checking the Distance and Direction to Your Destination—NAV mode

Editing the Latitude/Longitude Data to be Used for Nagivation

You can retrieve or sort the latitude/longitude data of WP and MP to be used for navigation.



Calling up the WP or MP memory numbers in order

1 **Press the EDIT button.**
The unit enters the memory number edit mode.

```
EDIT NAV POINT
WP-01:[HARBOR]
```

2 **Press the △/▽ button to select WP or MP.**
To call up the WP memory numbers, select WP.
To call up the MP memory numbers, select MP.

```
EDIT NAV POINT
WP-01:[HARBOR]
```

Example: when you call up WP memory numbers

3 **Press the ENTER button.**

```
WP-01:N 12°34'56.7"
HARBOR:E123°45'57.8"
```

(Continued)

(Continued)

4 **Press the △/▽ button to select the memory number to be called up.**

5 **When you have checked the latitude/longitude of the memory number, press the ENTER button.**
The display returns to that of step 1.

To call up the WP or MP memory numbers by entering a title

1 **Press the EDIT button.**

```
EDIT NAV POINT
WP-01:[HARBOR]
```

2 **Press the △/▽ button to select WP or MP.**

3 **Press the ←/→ button to move the cursor to the title.**

4 **Enter the title with the ←, →, △, and ▽ buttons.**
To advance/reverse the characters, press the △/▽ button.
To move the cursor back/forth, press the ←/→ button.

```
EDIT NAV POINT
WP-01:[ISLAND]
```

5 **Press the ENTER button.**
The latitude and longitude of the memory number of the title appear.

```
WP-01:N 12°34'56.7"
ISLAND:E123°45'57.8"
```

6 **After you have checked the data, press the ENTER button.**
The display returns to that of step 1.

Checking the Distance and Direction to Your Destination—NAV mode

To change the WP or MP title in memory

1 **Call up the memory number.**
See page 38 for the operation.

2 **Press the ←/→ button to move the cursor to the title.**

3 **Press the CLEAR button.**
The title disappears.

4 **Enter the new title with ←, →, △, and ▽ buttons.**
To advance/reverse the characters, press the △/▽ button.
To move the cursor back and forth, press the ←/→ button.

5 **Press the ENTER button.**
The new title is stored.

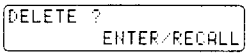
To delete the stored latitude/longitude data of WP or MP

1 **Call up the memory number.**
See page 38 for the operation.

2 **Press the ←/→ button to move the cursor to the title.**

3 **Press the CLEAR button.**
The title disappears.

4 **Press the ENTER button.**



5 **Press the ENTER button again.**
The latitude/longitude data on the display is deleted from memory.

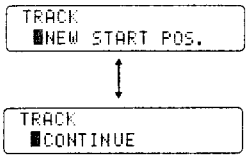
To cancel deletion
Press the RECALL button.

If you try to delete the latitude/longitude data being used for navigation
"DATA IN USE!" appears. Press the RECALL button. The display returns to the previous one. Select the latitude/longitude data to be deleted again. To delete the data stored in your route, first turn off the NAV mode (page 35) then delete the memory (page 31).

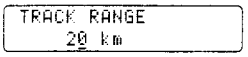
Tracking the Distance, Direction and Points You have Passed —TRACK mode

(Continued)

2 **Press the △/▽ button to display the start point to be entered.**
To enter a new start point, display "NEW START POS."
To continue from the start point you have entered, display "CONTINUE" and go to step 5.
Each time you press the △/▽ button, "NEW START POS." and "CONTINUE" appear alternately.



3 **Press the ENTER button.**

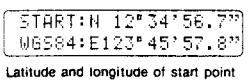


4 **Press the △/▽ button to display a reduced scale ratio.**

Example: when you select 500 kilometers

Length unit	▽ button←				→△ button		
Meter	20	50	100	200	500	1000	kilometer
Land-mile	12	30	60	125	310	620	mile
Sea-mile	10	27	55	110	270	540	nmile

5 **Press the ENTER button.**
When you select "CONTINUE" in step 2 and skip steps 3 and 4, this display of the start point appears.

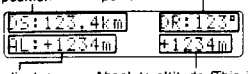


Latitude and longitude of start point

6 **Press the ENTER button.**

Distance from the start point to your present position

Direction of the present position from the start point

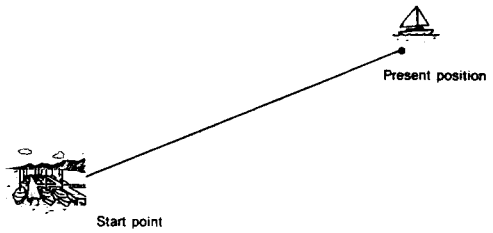


Relative altitude (This indicates the altitude when that of the start point is treated as 0.)

Absolute altitude (This is the altitude based on WGS84 coordinate.)

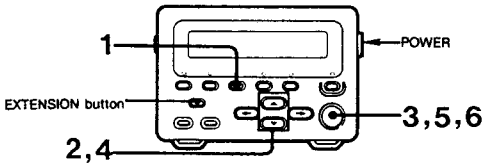
Tracking Distance, Direction and the Points You have Passed—TRACK Mode

The unit displays the distance, direction and points you have passed from the start point to your present position. As the start point for the TRACK mode, you can use the point you started from or any point you have passed. Use this function to know all the points you have passed up to your present position.

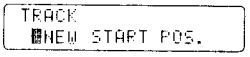


Concept

Displaying the Distance, Direction and Points You have Passed



1 **Press the TRACK button.**
The unit enters TRACK mode.

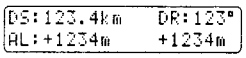


(Continued)

To see the points you have passed in the graphic display

The graphic display of the unit shows the points you passed from the start point to the present position in a rough figure.
(Note: In the graphic display, the discrepancy is large around the pole.)

Press the EXTENSION button.
Each time you press the EXTENSION button, the character display and graphic display appear alternately.



Character display

Started position

Press △/▽ button to scroll. The horizontal scale ratio corresponds to the ratio selected in step 2.

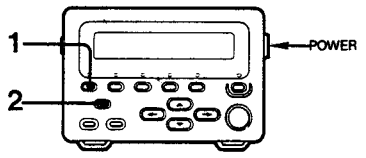
Present position

Graphic display

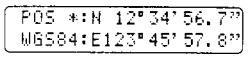
Displaying the Date and Time

The UTC date and time signal is included in the signal from the GPS satellites. The unit receives the radio beam and displays the date and time.

Displaying the Date and Time



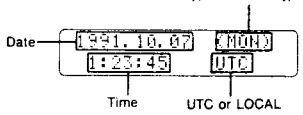
1 **Press the POS button.**
Your present position appears.



2 **Press the EXTENSION button.**
The date and time appears for 5 seconds.

Day of week (MON: Monday, TUE: Tuesday, WED: Wednesday, THU: Thursday, FRI: Friday, SAT: Saturday, SUN: Sunday)

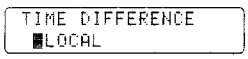
Date and time display



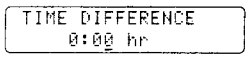
Displaying the Date and Time

(Continued)

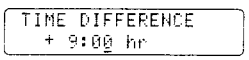
4 **Press the △/▽ button to display "LOCAL".**
Each time you press the △/▽ button, UTC and LOCAL appear alternately.



5 **Press the ENTER button.**



6 **Press the △/▽ button until the time differential of the area appears.**
See the coordinated universal time differential chart on page 47.
You can enter time differential from −15:30 to +15:30 in 30-minute intervals.
The display changes as follows.
▽ button △ button
−15:30↔−15:00↔...↔0↔...
+15:00↔+15:30



▽ button← →△ button

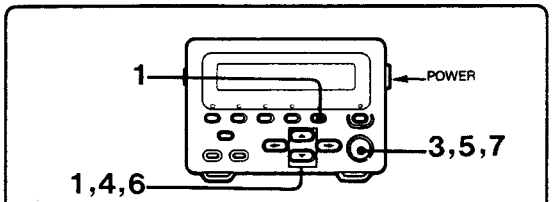
−15:30↔−15:00↔...↔0↔...+15:00↔+15:30

7 **Press the ENTER button.**
When you display the date and time, the local time appears.

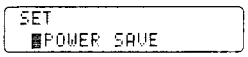
To return to the UTC display
Display UTC in step 4.

Setting the Local Time

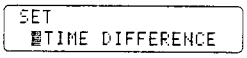
By entering the time differential from the universal standard time, you can set the unit to display the local time of the area. Set to the local time when you stay there for a while. Refer to the coordinated Universal Time Chart (page 47) for the time differential of the area.



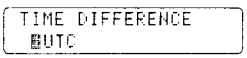
1 **Press the SET button.**



2 **Press the △/▽ button until "TIME DIFFERENCE" appears.**
Each time you press the △/▽ button, the display changes in the following sequence.
POWER SAVE↔CROSS WAY POINT↔TIME DIFFERENCE↔ GEODETIC SYSTEM↔LENGTH UNIT↔DIRECTION↔POS. PRECISION↔INITIALIZE GPS RCV.↔POWER SAVE



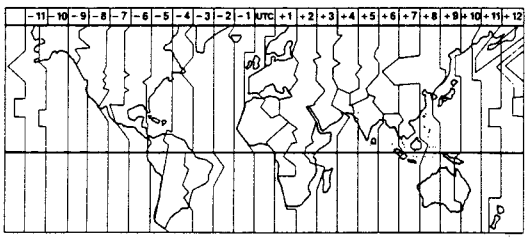
3 **Press the ENTER button.**
You can select the time display.



(Continued)

Coordinated Universal Time Differential Chart

To set the local time, see page 45.



Changing the Unit

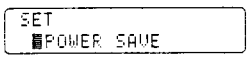
You can select the unit of length (distance), direction and altitude according to the location and situation.

Display	Unit
Length (distance)	Meters
	Miles
	Nautical miles
Direction	Degrees
	N/S/E/W

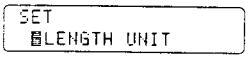
Changing the Units of Distance

Set the appropriate unit according to whether you are travelling by land, sea, or air.

1 **Press the SET button.**



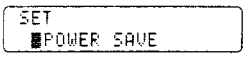
2 **Press the △/▽ button until "LENGTH UNIT" appears.**
Each time you press the △/▽ button, the display changes in the following sequence.
POWER SAVE↔CROSS WAY POINT↔TIME DIFFERENCE↔ GEODETIC SYSTEM↔LENGTH UNIT↔DIRECTION↔POS. PRECISION↔INITIALIZE GPS RCV.↔POWER SAVE



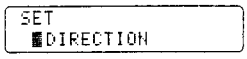
(Continued)

Changing the Unit

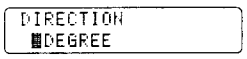
1 **Press the SET button.**



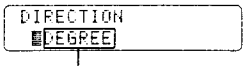
2 **Press the △/▽ button until "DIRECTION" appears.**
Each time you press the △/▽ button, the display changes in the following sequence.
POWER SAVE↔CROSS WAY POINT↔TIME DIFFERENCE↔ GEODETIC SYSTEM↔LENGTH UNIT↔DIRECTION↔POS. PRECISION↔INITIALIZE GPS RCV.↔POWER SAVE



3 **Press the ENTER button.**



4 **Press the △/▽ button to select the desired units.**
Each time you press the △/▽ button, DEGREE and 16 POINTS (NSEW) appear alternately.

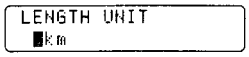


Appears when you select DEGREE.

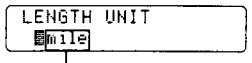
5 **Press the ENTER button.**
The direction appears in the selected unit.

(Continued)

3 **Press the ENTER button.**



4 **Press the △/▽ button until the unit you want appears.**
Each time you press the △/▽ button, the display changes in the following sequence.
km↔ mile ↔nmile*



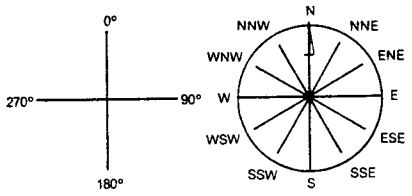
Appears when you have selected mile.

*"nmile" stands for nautical miles.

5 **Press the ENTER button.**
The distance appears in the selected unit.

Changing the Units of Direction

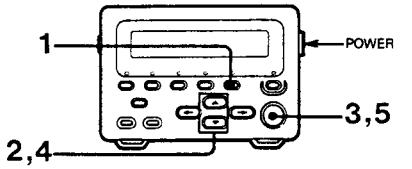
When you want to decide the direction in detail, set to the degree display. When you want to decide the direction roughly, set to the NSEW display.



Degree display NSEW display

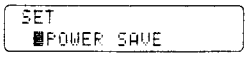
Setting Latitude and Longitude to a Chart

By setting the coordinate area which determines the latitude and longitude to that of each area, you can set the unit to display the identical latitude and longitude as your map. For the coordinate area, see the table of coordinate systems of each country/area on page 53.
When you want to navigate the area in detail referring to an area map, or when you stay in the area for a while, set the coordinate area.
(Read "How to determine your position with the GPS" on page 4 for reference.)

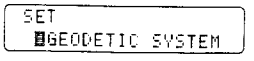


Set the Japanese coordinate area (JAPAN) for example.

1 **Press the SET button.**



2 **Press the △/▽ button to select "GEODETIC SYSTEM".**
Each time you press the △/▽ button, the display changes in the following sequence.
POWER SAVE↔CROSS WAY POINT↔TIME DIFFERENCE↔ GEODETIC SYSTEM↔LENGTH UNIT↔DIRECTION↔POS. PRECISION↔INITIALIZE GPS RCV↔POWER SAVE

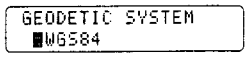


(Continued)

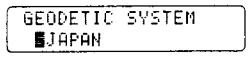
Changing the Unit

(Continued)

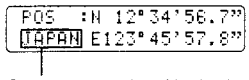
3 **Press the ENTER button.**



4 **Press the △/▽ button to select "JAPAN".**
Each time you press the △/▽ button, the coordinate area changes in sequence. (See the table on page 53.)



5 **Press the ENTER button.**
The latitude and longitude displayed from next time is that determined by the coordinate area selected in step 4. (In these operating instructions, we selected the Japanese coordinate area ("JAPAN" for example.)
Example: Latitude and longitude of your present position



Coordinate area selected in step 4.

Table of Coordinate Area

See page 51 to set the coordinate area.

Area	Coordinate area	Country	Geodetic system
AFRICA	AFRI 1	Ethiopia Mali Senegal Sudan	ADINDAN
	AFRI 2	Botswana Lesotho Malawi Swaziland Zaire Zambia Zimbawe South Africa	ARC 1950
	AFRI 3	Morocco	MERCHICH
ASIA	JAPAN	Japan Korea	TOKYO
	ASIA 1	Hong Kong	HONG KONG 1963
	ASIA 2	Singapore	SOUTH ASIA
	ASIA 3	Philippines	LUZON
	ASIA 4	Thailand Vietnam Bangladesh India Nepal	INDIAN
	ASIA 5	West Malaysia Singapore	KERTAU 1948
CENTRAL AMERICA	CEAM 1	Belize Costa Rica El Salvador Guatemala Honduras Nicaragua Mexico	NORTH AMERICAN 1927

(Continued)

Changing the Unit

(Continued)

Table of Coordinate System

See page 51 to set the coordinate area.

Area	Coordinate area	Country	Geodetic system
EUROPE	EURO 1	Australia Belgium Cyprus Channel Island Denmark England Finland France Federal Republic of Germany Gibraltar Greece Ireland Islands Italy Luxembourg Netherlands Norway Portugal Scotland Shetland Islands Spain Sweden Swizerland	EUROPEAN 1950
	EURO 2	Ireland	IRELAND 1965
	EURO 3	England Isle of Man Scotland Shetland Islands Wales	ORDNANCE SURVEY OF GREAT BRITAIN 1936
MIDDLE EAST	MDEA 1	Masirash Island Oman United Arab Emirates Saudi Arabia	NAHRWAN
	MDEA 2	Egypt	OLD EGYPTIAN

Area	Coordinate area	Country	Geodetic system
NORTH AMERICA	NOAM 1	Canada Newfoundland Island	NORTH AMERICAN 1927
	NOAM 2	Alaska Canada Mexico Central America Unites States of America	NORTH AMERICAN 1983
	USA	United States of America	Western United States Eastern United States
OCEANIA	OCEA 1	Australia Tasmania Island	AUSTRALIAN GEODETIC 1984
	OCEA 2	New Zealand	GEODETIC 1949
SOUTH AMERICA	SOAM 1	Bolivia Chile Colombia Ecuador Guyana Peru Venezuela	PROVISIONAL SOUTH AMERICAN 1956
	SOAM 2	Argentina Bolivia Brazil Chile Colombia Ecuador Guyana Paraguay Peru Trinidad and Tobago Venezuela	SOUTH AMERICA 1969
	SAME 3	Argentina	CAMPO INCHAUSPE
	SAME 4	Brazil	CORREGO ALEGRE

Setting the Display Interval —Power-Saving Function

By setting the interval of renewing the display data, you can have the unit automatically survey and display the latitude and longitude. You can set the interval from 10 to 90 minutes in 10-minute intervals. When you use this unit continuously for a long distance and time, use this function to save on power consumption.
When the unit enters an area having a radius four times greater than set using cross point function, the unit surveys the latitude and longitude continuously.

1 **Press the SET button.**

SET
▮POWER SAVE

2 **Press the △/▽ button to select "POWER SAVE".**
Each time you press the △/▽ button, the display changes in the following sequence.
POWER SAVE↔CROSS WAY POINT↔TIME DIFFERENCE↔ GEODETIC SYSTEM↔LENGTH UNTI↔DIRECTION↔POS. PRECISION↔INITIALIZE GPS RCV.↔POWER SAVE

SET
▮POWER SAVE

3 **Press the ENTER button.**

POWER SAVE
▮OFF

(Continued)

(Continued)

4 **Press the △/▽ button to select "ON".**
Each time you press the △/▽ button, ON and OFF appear alternately.

POWER SAVE
▮ON

5 **Press the ENTER button.**

POWER ON INTERVAL
10 min

6 **Press the △/▽ button to select the desired interval.**
You can select an interval from 10 to 90 minutes in 10-minute intervals.
To select a long/short interval, press the △/▽ button.

POWER ON INTERVAL
60 min

Example: when you select the 60-minute interval

7 **Press the ENTER button.**
The unit automatically renews the data when the selected interval has passed.
While navigating, the interval becomes one fifth of the selected interval.

To release the function
Display "OFF" in step 4.

Note
This function is not available when the unit is not receiving the data from GPS satellites.

Setting the Positioning Precision

The GPS satellites are moving around the earth.
The data of latitude and longitude could have some error according to the location of the satellites. With this unit, you can choose the allowable margin of error by three steps (HIGH/MIDDLE/LOW). The unit doesn't show the data when the precision is lower than your setting. Choose "HIGH" when you memory the present location or when you use the unit in NAV mode or TRACK mode.
Note: Using this function, you can check the data to be used in POS mode.

1 **Press the SET button.**

POSITION PRECISION
▮MIDDLE

2 **Press the △/▽ button to select "POS.PRECISION".**
Each time you press the △/▽ button, the display changes in the following sequence.
POWER SAVE↔CROSS WAY POINT↔TIME DIFFERENCE↔ GEODETIC SYSTEM↔LENGTH unit↔DIRECTION↔POS. PRECISION↔INITIALIZE REV.↔ POWER SAVE

SET
▮POS. PRECISION

3 **Press the ENTER button.**

SET
▮POWER SAVE

(Continued)

(Continued)

4 **Press the △/▽ button until the precision of the latitude and longitude you want appears.**
Each time you press the △/▽ button, the display changes in the following sequence.
LOW↔MIDDLE↔HIGH
If you want the high positioning precision, select HIGH.

SET
▮POS. PRECISION

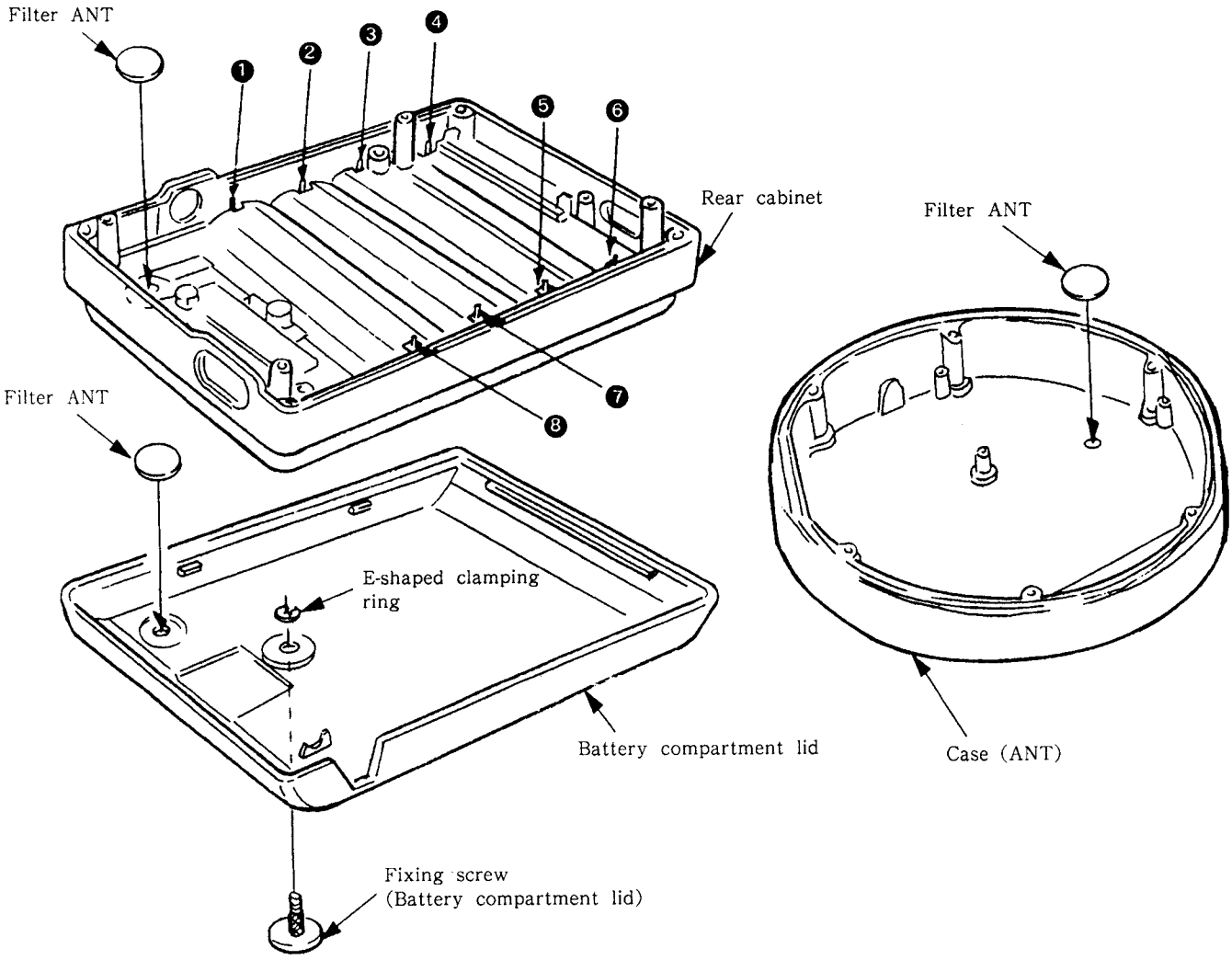
5 **Press the ENTER button.**
You can set the positioning precision you want.

POSITION PRECISION
▮LOW

SECTION 2
DISASSEMBLY

[SPLASH-PROOF TREATMENT]

1. Apply sealant solvent to spaces ❶ – ❽ between the terminal and cabinet. (7-432-950-03)
2. Affix filter ANTs (Goa-tex) to the center of holes after peeling off the paper.



SECTION 3
SERVICE MODE

[SELF-DIAGNOSIS FUNCTION]

1. Before Entering the Service Mode

Turn ON the power with KDU and the antenna unit connected.

Press the [SET] key when the **WAITING ACQ** indication appears.

Press [EXTENSION] + [△].

Note : [EXTENSION] + [△] means that pressing [△] while pressing the [EXTENSION] key.

service mode
(c) Sony Corp.–

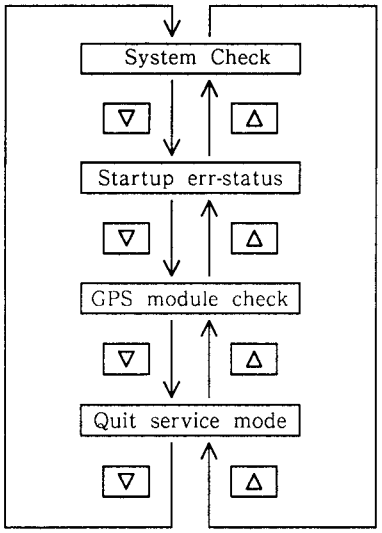
On this screen :

Press [EXTENSION] : You can see the KDU Software version.

[CLEAR] : You can see the Software version on the antenna unit side.

[△] + [▽] + [⇦] + [⇨] + [ENTER] : Entering into the Service mode.

2. General Description and Operation of the Service Mode



By pressing the [ENTER] key while displaying the service mode, each function mode can be obtained with the [△], [▽] keys.

- ▷ System check
  Hardware check of system
- ▷ Startup err-status
  This mode can be used to see the result of the self-diagnosis that was performed automatically when turning ON the power.
- ▷ GPS module check
  This mode transmits a command to the antenna unit and checks the GPS module.
- ▷ Quit service mode
  Log out from Service mode.

2-1. System Check

This mode automatically checks the hardware, and then displays the result.

1) Visually check the lighting LEDs in the order shown below.
   POS → NAV → TRACK → EDIT → MARK → SET

2) GPS receiver sense inspection
   This mode checks whether GPS is connected or not when the GPS power is turned ON (Power ON on the GPS side) (according to GPU 59 pin input).

Check GPS sens' pwr

: An error has occurred if this indication appears.

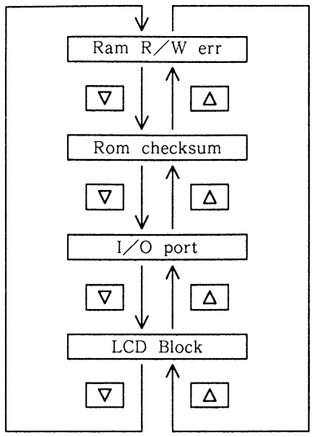
Note : There are some items that have not been checked. The items shown below can be checked in others modes than the service mode.

Note 1 : Light SW and Backlight ON/OFF
Backlight ON/OFF can be checked with the Light SW.

Note 2 : Power detection
Battery Low/Removal and irq0, P84, P85.
Control the voltage applied to the set and confirm whether Battery Low (4.0V) and Battery Removal (3.75V) can be detected or not with the display. Also confirm whether the display is recovered or not when temporarily returning the voltage from Battery Low to normal voltage.
Pay attention to see if the set enters the Battery Removal status, as the set cannot be recovered without turning the power ON again.

Note 3 : Checking of LCD screen display, beep sound and key Since these checks are performed in usual usage, these checking procedures are omitted in this service mode section.

2-2. Startup err-status



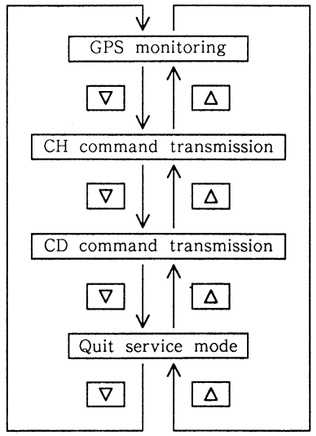
▷ Ram R/W err : RAM read/write error
0 0 0 0 : No error
Others : Error address will be indicated

▷ Ram checksum : Checksum inspection of RAM area
0 0 0 0 : No error
Others : Value of error checksum

▷ I/O port : I/O port check
0 0 0 0 : No error port
× × × × : Error port number
(ex) 9092
P90 and P92 have erred.

▷ LCD Block : Read/write error check of external RAM
0 0 0 0 : No error
Others : Error address

2-3. GPS module check



▷ GPS monitoring
Used for monitoring the satellite broadcasting reception status of GPS.
Used for monitoring that CH command and CD command after transmission.

▷ CH command
Press the [ENTER] key and move the cursor with the [⇦], [⇨] keys when the cursor comes on the desired figure.
Change the figures with the [▽], [△] keys. (The figures indicate the satellite numbers.)
Transmission is completed with the [ENTER] key.

▷ CD command
Transmission is completed with the [ENTER] key.
This command should be transmitted to log out form the service mode and to initialize the set when a specific satellite is assigned with the CH command. Do not forget this !!

▷ Quit the service mode
Press the [ENTER] key to log out from the service mode.

2-4. Quit service mode

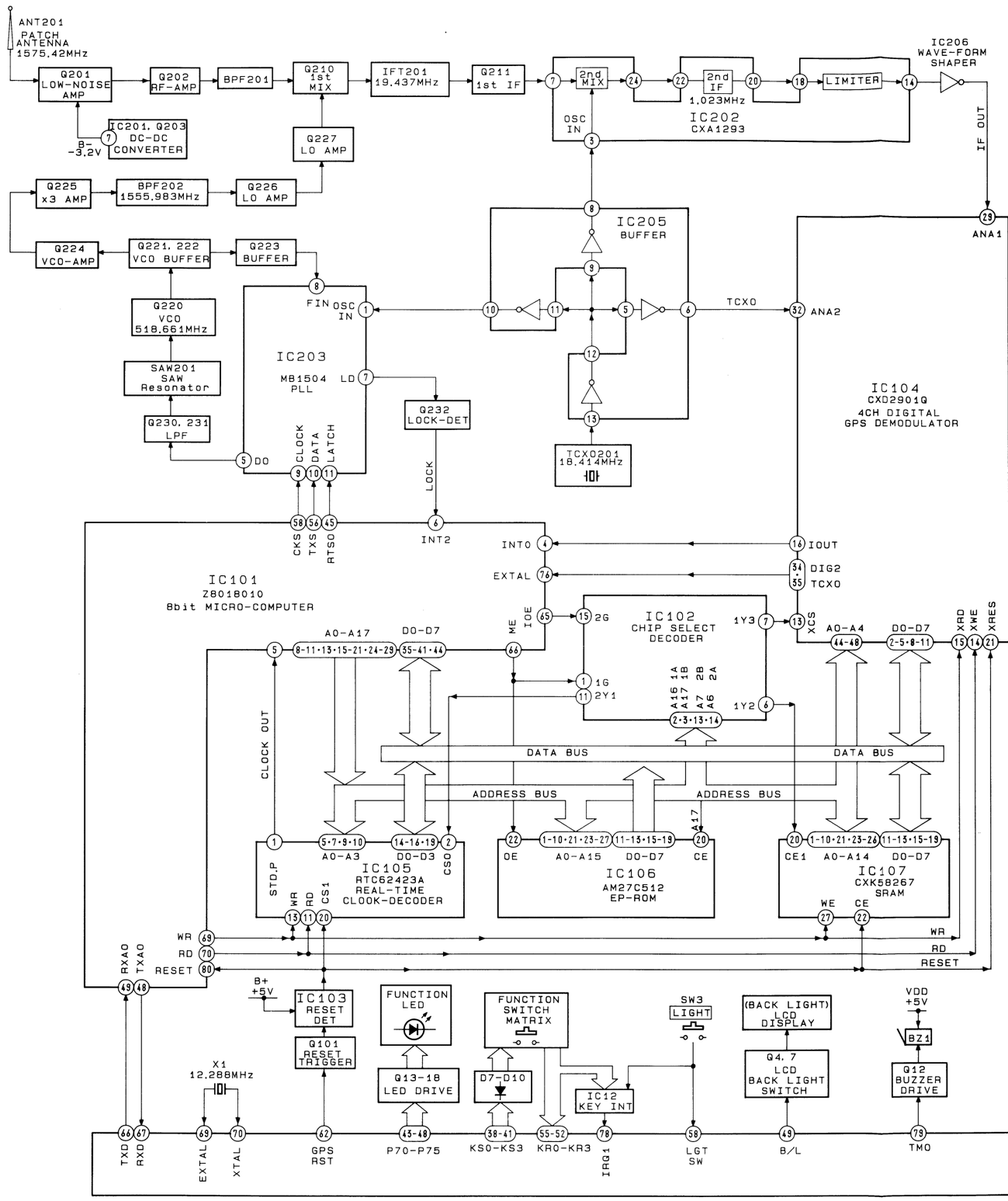
▷ Quit service mode
Press the [ENTER] key to log out from the service mode.

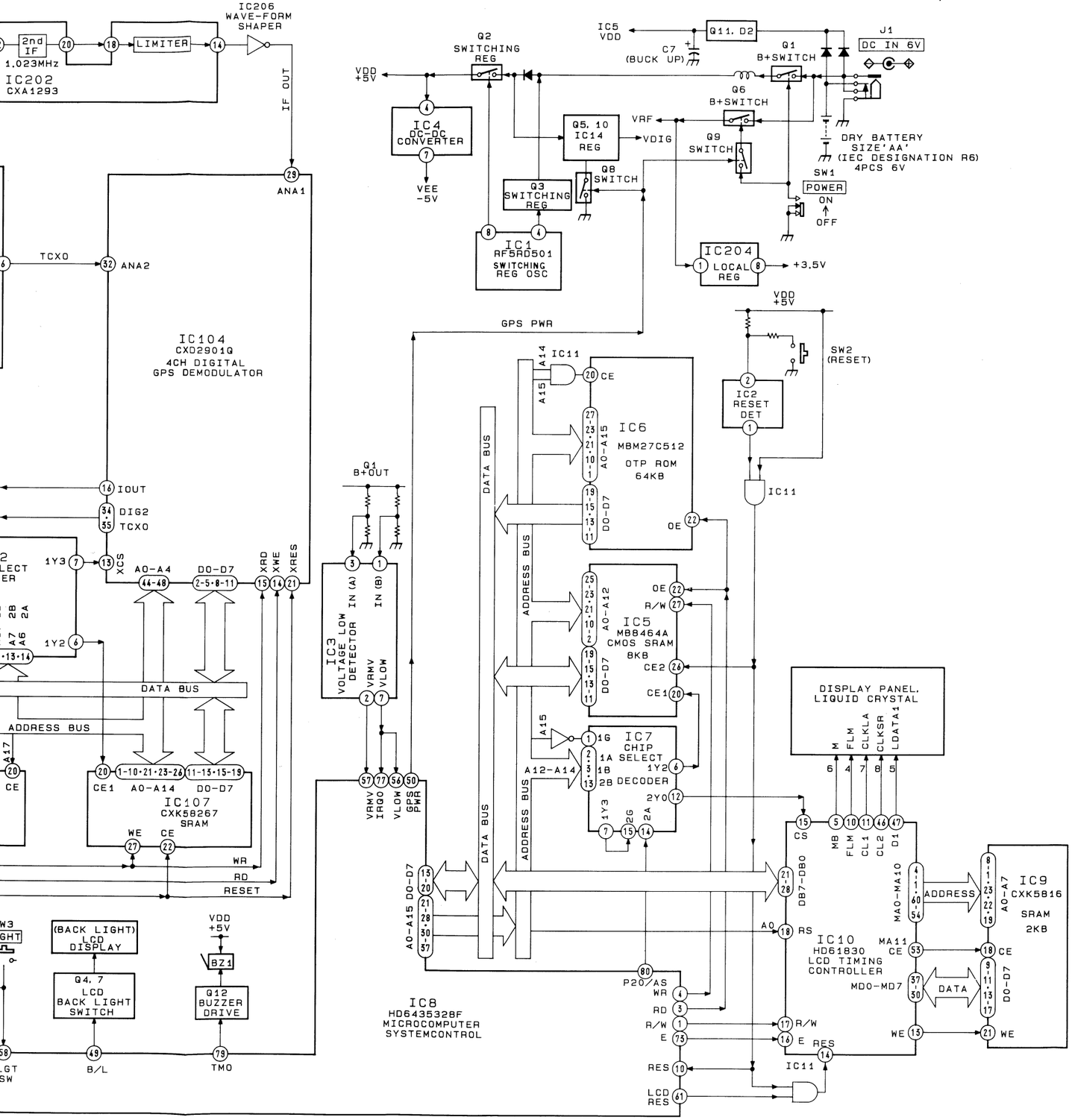
3. ＊＊Status× × ＊＊ Indication

＊＊status 01＊＊ : An error has been detected.
The contents can be obtained in startup err-status of the service mode.
＊＊status 02＊＊ : Transmission error
Transmission cannot be performed between KDU and the antenna unit.
＊＊status 03＊＊ : The PLL has been unlocked.

SECTION 4
DIAGRAMS

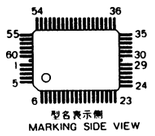
4-1. BLOCK DIAGRAM




IC206
WAVE-FORM
SHAPER
2nd
IF
1.023MHz
LIMITER
IC202
CXA1293
IF OUT
ANA1
TCXO
ANA2
IC104
CXD2901Q
4CH DIGITAL
GPS DEMODULATOR
IOUT
DIG2
TCXO
XCS
AO-A4
DO-D7
XRD
XWE
XRES
DATA BUS
ADDRESS BUS
CE1
AO-A14
DO-D7
IC107
CXK58267
SRAM
WE
CE
WR
RD
RESET
IC3
VOLTAGE LOW
DETECTOR
IN (A)
IN (B)
VRMV
VLOW
VRMV
IRQ0
VLOW
GPS
PWR
Q1
B+OUT
GPS PWR
IC8
HD6435328F
MICROCOMPUTER
SYSTEMCONTROL
P20/AS
WR
RD
R/W
E
RES
LCD
RES
IC11
A14
A15
CE
IC6
M8M27C512
OTP ROM
64KB
AO-A15
DO-D7
OE
IC5
M88464A
CMOS SRAM
8KB
AO-A12
R/W
CE2
CE1
IC7
CHIP
SELECT
DECODER
1G
1A
1B
2B
1Y2
2Y0
1Y3
2G
2A
A12-A14
A15
IC1
RF5RD501
SWITCHING
REG OSC
IC4
DC-DC
CONVERTER
VEE
-5V
VDD
+5V
Q2
SWITCHING
REG
Q3
SWITCHING
REG
Q5, 10
IC14
REG
VDIG
Q8
SWITCH
VRF
Q6
B+SWITCH
Q9
SWITCH
IC5
VDD
Q11, D2
C7
(BUCK UP)
Q1
B+SWITCH
J1
DC IN 6V
DRY BATTERY
SIZE'AA'
(IEC DESIGNATION R6)
4PCS 6V
SW1
POWER
ON
OFF
IC204
LOCAL
REG
+3.5V
SW2
(RESET)
IC2
RESET
DET
IC11
DISPLAY PANEL,
LIQUID CRYSTAL
M
FLM
CLKLA
CLKSR
LDATA1
IC10
HD61830
LCD TIMING
CONTROLLER
CS
MB
FLM
CL1
CL2
D1
DB7-DB0
RS
R/W
E
RES
MA0-MA10
MA11
CE
MD0-MD7
ADDRESS
DATA
WE
IC9
CXK5816
SRAM
2KB
AO-A7
CE
DO-D7
WE
(BACK LIGHT)
LCD
DISPLAY
Q4, 7
LCD
BACK LIGHT
SWITCH
B/L
BZ1
Q12
BUZZER
DRIVE
TMO

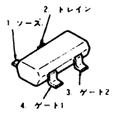
• SEMICONDUCTOR LEAD LAYOUTS

HD61830A00H

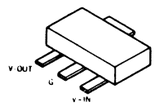


2SK209G

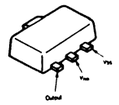
3SK166-2
3SK165-1



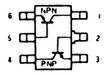
M5236ML



S-8054ALB

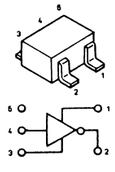


XN4601

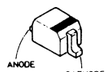


DAN202U

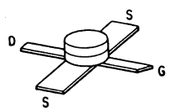
SC7SU04F



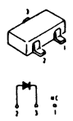
1SS332
HVU350



FHX35LG

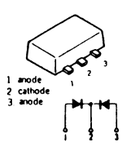


RD5.6M
RB400D
MA152WK

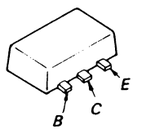


2SA1162
2SA1586YG
2SC2712YG
DTA124EU
DTC124EU
2SC3142-J3
2SC3585
2SC3829

RB110C



2SB1121-S
2SB798DL



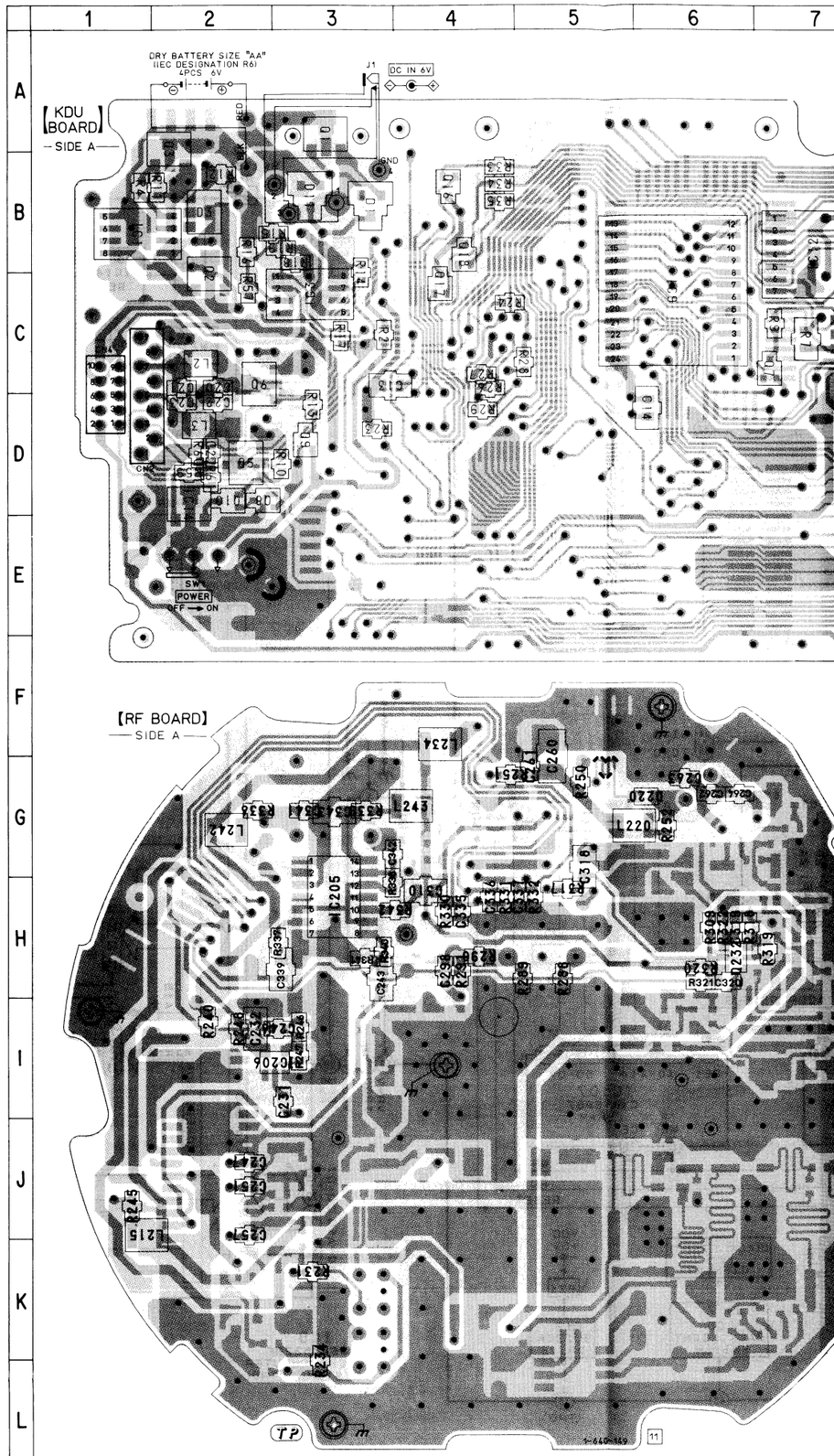
• SEMICONDUCTOR LOCATION

Ref. No.	Location	Ref. No.	Location
D1	B-3	Q1	A-3
D2	B-19	Q2	B-2
D3	B-2	Q3	A-2
D4	E-18	Q4	C-7
D6	C-18	Q5	D-2
D7	C-8	Q6	C-2
D8	C-8	Q7	C-7
D9	C-8	Q8	D-2
D10	C-8	Q9	D-3
D11	B-3	Q10	D-2
D101	J-20	Q11	B-18
D102	I-22	Q12	B-19
D201	K-10	Q13	B-14
D220	G-6	Q14	B-13
D221	G-9	Q15	B-13
D222	I-10	Q16	B-4
		Q17	C-4
IC1	B-1	Q18	B-4
IC2	E-18	Q101	J-21
IC3	C-3	Q102	J-21
IC4	C-18		
IC5	E-10	Q201	J-10
		Q202	J-10
IC6	E-11	Q203	K-9
IC7	E-13	Q210	J-13
IC8	C-13	Q211	K-14
IC9	C-6		
IC10	C-11	Q220	G-10
		Q221	H-9
IC11	E-14	Q222	H-9
IC12	B-7	Q223	G-10
IC13	E-13	Q224	I-9
IC14	D-2		
IC201	K-11	Q225	I-10
		Q226	H-12
IC202	J-14	Q227	I-13
IC203	G-11	Q230	G-12
IC204	I-13	Q231	G-12
IC205	H-3	Q232	H-6
IC206	I-3		

Note :

- ● : Through hole.
- ▒ : Pattern on the side which is seen.
- ▒ : Pattern of the rear side.

4-2. PRINTED WIRING BOARDS



【KDU BOARD】
SIDE B

【KDU SUB BOARD】

【LCD/KEY BOARD】

THIS UNIT IS SUPPLIED AS THE ASSEMBLED BLOCK (1-809-398-11)

【RF BOARD】
— SIDE B —

【DIGITAL BOARD】

SONY
PYXIS
GLOBAL POSITIONING SYSTEM
ANT201

1 2 3 4 5 6 7

A B C D E F G H I

【RF BOARD】

ANT201 PATCH ANTENNA 1575.42MHZ

CNC201 CN201 STRIP-LINE STRIP-LINE Q201 FHX35LG LOW-NOISE AMP STRIP-LINE STRIP-LINE Q202 3SK166 RF-AMP STRIP-LINE R206 10 BPF201 BPF

C201 22p C202 10p C209 10p

IC201 SC17660 DC-DC CONVERTER

R201 1k C203 100p R202 100 C204 100p R205 470 R207 470 R208 470

R203 10k C207 10p 3.9 R223 47 R204 33k C205 10p C206 1000p C208 1000p L201 22nH

R211 1k 3.3 R212 220k 1.7 IC201 R216 1k -0.4 C212 100p C213 1 C211 1 R215 47k Q203 2SA1586 BIAS C214 100p 2.1 R217 10k R220 1k R222 100 R213 1k R214 22k R219 1k R218 1k R221 1k D201 DAN202U

C215 22 6.3V C216 22 6.3V C217 0.1 C218 22 6.3V C219 22 6.3V

3.5V

Q224 2SC3829 VCO-AMP L226 100nH R283 47 L227 100nH R280 15k 4.3 C290 22p R281 15k 1.1 1.9 R282 220 R284 470 C291 22p C293 0.047 C294 22p

Q225 2SC3585 X3-AMP L228 22nH R285 1k R286 1k R287 47 D222 DAN202U L229 10nH C296 0.01 B C297 22p R288 100

BPF202 1555.983MHZ BPF R289 470 R290 10 R291 470 R292 6.8k C298 10p R293 10k

LOCAL OUT

Q226 2SC3585 LO-AMP L230 22nH R295 10 L231 10nH C299 4p R294 220 C301 0.01 B C302 3p R296 220

Q227 2SC3585 LO-AMP R300 10 L232 10nH R297 5.6k R298 10k C303 3p R299 220 C305 0.01 B C306 220p R301 220

C292 1000p C295 470p C300 470p C304 470p

LPF (VC) OUT

Q220 2SC3829 VCO- 518.661MHZ L221 100nH R257 47 R258 1k R259 22k

Q222 2SC3829 VCO-BUFFER L223 100nH R263 47 L224 100nH R264 10k R265 470 C276 5p R266 18 R268 18 R267 18 C277 10p

Q223 2SC3829 BUFFER R272 47 R269 15k L225 100nH C281 1000p R273 220 R271 220 C278 22p C280 0.047

SAW201 RESONATOR L220 1μH R252 1k R254 3.3k C262 7p C264 470p R250 10k R251 1k C260 0.1 C261 470p D220 HVU350 L219 25nH C263 5p C282 4p R255 3.3k R256 150 D221 DAN202U L222 100nH C265 0.01 B C266 22 6.3V C267 2p C268 3p C269 0.047 C270 1000p R260 22k Q221 2SC3829 VCO-BUFFER C273 0.01 B C275 0.047

R261 220 C271 1000p R262 22k C272 470p C274 1000p C279 1000p

R309 10k R322 100 R316 100 R315 2.2k L234 100μH C315 0.015 R312 22k L233 100nH R310 10

Q231 XN4601 LPF Q230 2SK209 LPF R313 2.2k

IC203

IC203 MB1504 PLL

16 15 14 13 12 11 10 9 — ØR ØP FP FR FC LE DATA CLOCK

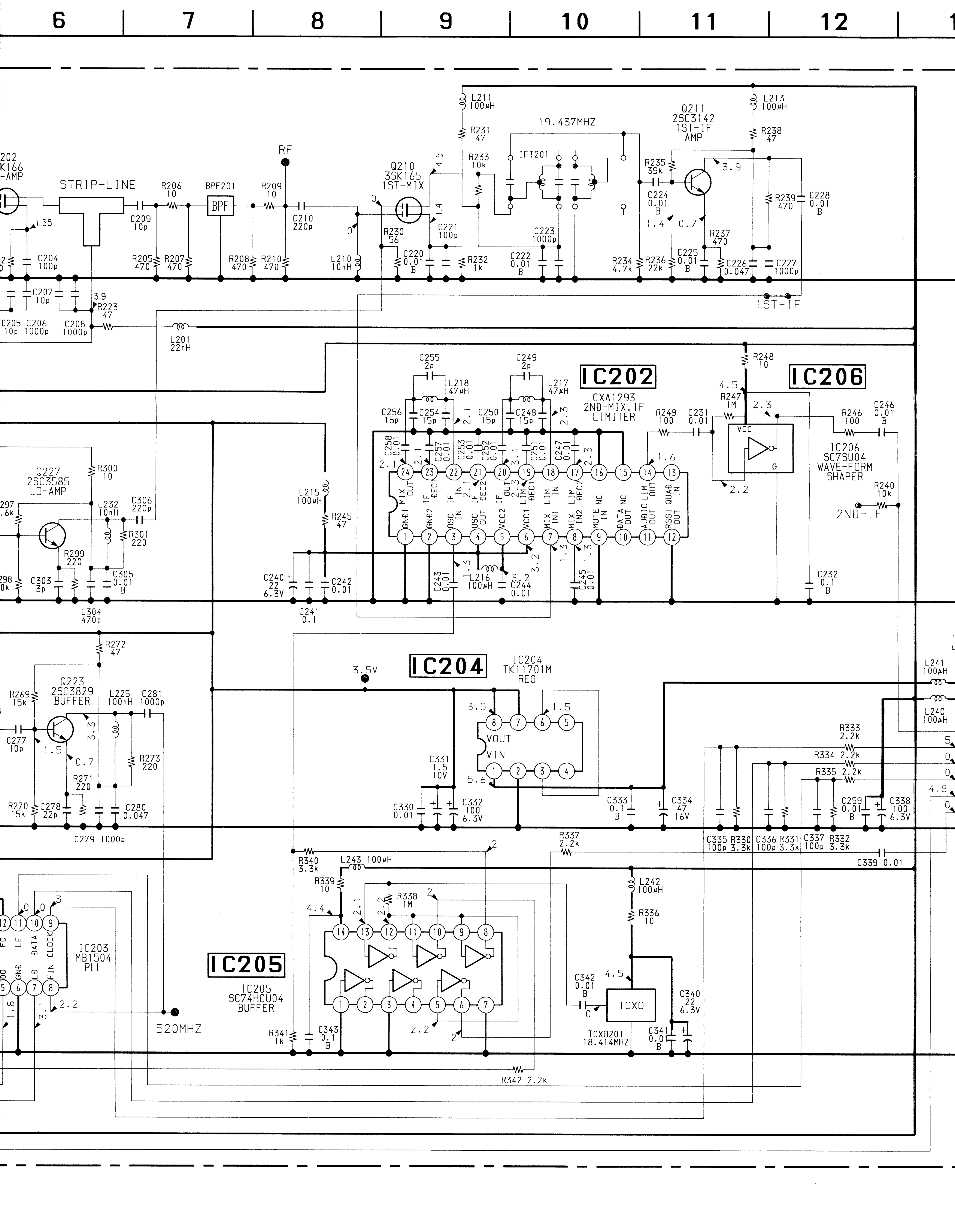
1 2 3 4 5 6 7 8 — OSC IN OSC OUT VP VCC ØD GNØ LØ FIN

520MHZ

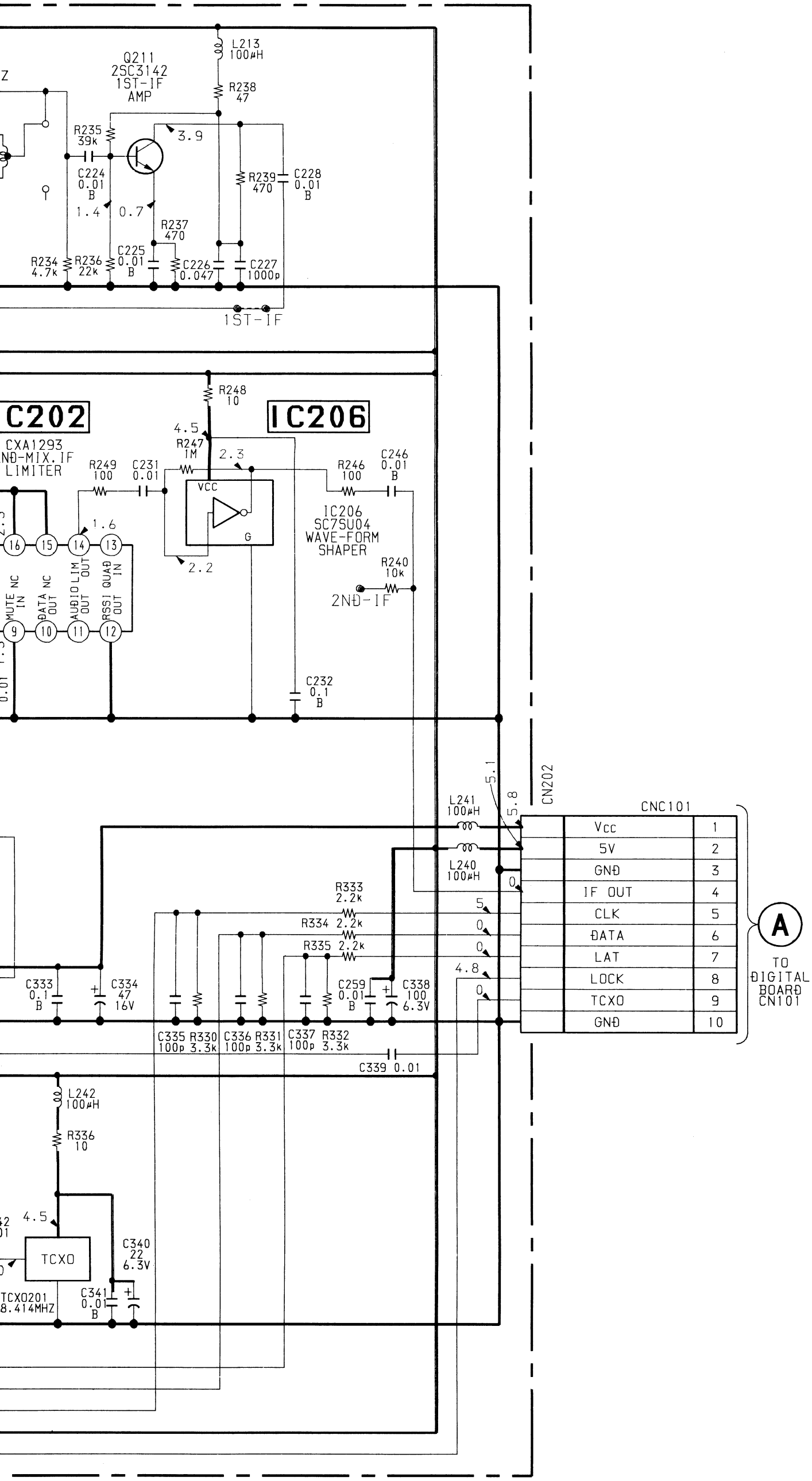
R320 10k R321 1k C320 0.01 B R319 1k C319 0.01 B R317 15k R318 10k C318 0.1 B C317 0.01 B C316 22 6.3V R314 3.3k R311 1k C314 220p C313 47 6.3V C312 0.1 C311 0.01 B C310 0.01 B

Q232 XN4601 LOCK-DET

TP



6
7
8
9
10
11
12
STRIP-LINE
R206 10
BPF201
BPF
R209 10
RF
C209 10p
C210 220p
R205 470
R207 470
R208 470
R210 470
C204 100p
C207 10p
C205 10p
C206 1000p
C208 1000p
R223 47
L201 22nH
Q210 3SK165 1ST-MIX
R230 56
C220 0.01 B
C221 100p
R232 1k
L210 10nH
L211 100μH
R231 47
R233 10k
19.437MHZ
IFT201
C222 0.01 B
C223 1000p
Q211 2SC3142 1ST-IF AMP
R235 39k
C224 0.01 B
R234 4.7k
R236 22k
C225 0.01 B
R237 470
C226 0.047
L213 100μH
R238 47
R239 470
C228 0.01 B
C227 1000p
1ST-IF
IC202
CXA1293 2ND-MIX.IF LIMITER
C255 2p
L218 47μH
C256 15p
C254 15p
C250 15p
C249 2p
L217 47μH
C248 15p
C258 0.01
C257 0.01
C253 0.01
C252 0.01
C251 0.01
C247 0.01
MIX OUT
IF DEC1
IF IN
IF DEC2
IF OUT
LIM DEC1
LIM IN
LIM DEC2
MUTE NC
DATA NC
AUDIO LIM OUT
QUAD IN
GND1
GND2
OSC IN
OSC OUT
VCC2
VCC1
MIX IN1
MIX IN2
MUTE IN
DATA OUT
AUDIO OUT
RSSI OUT
L215 100μH
R245 47
C240 22 6.3V
C241 0.1
C242 0.01
C243 0.01
L216 100μH
C244 0.01
C245 0.01
IC206
R248 10
R247 1M
R249 100
C231 0.01
VCC
G
R246 100
C246 0.01 B
IC206 SC7SU04 WAVE-FORM SHAPER
R240 10k
2ND-IF
C232 0.1 B
Q227 2SC3585 LO-AMP
R300 10
L232 10nH
C306 220p
R301 220
R299 220
C303 3p
C305 0.01 B
C304 470p
R272 47
Q223 2SC3829 BUFFER
R269 15k
L225 100nH
C281 1000p
C277 10p
R273 220
R271 220
R270 15k
C278 22p
C280 0.047
C279 1000p
IC204
IC204 TK11701M REG
3.5V
VOUT
VIN
C331 1.5 10V
C330 0.01
C332 100 6.3V
C333 0.1 B
C334 47 16V
L241 100μH
L240 100μH
R333 2.2k
R334 2.2k
R335 2.2k
C259 0.01 B
C338 100 6.3V
C335 100p
R330 3.3k
C336 100p
R331 3.3k
C337 100p
R332 3.3k
C339 0.01
R337 2.2k
R340 3.3k
L243 100μH
R339 10
R338 1M
L242 100μH
R336 10
IC203 MB1504 PLL
FC
LE
DATA
CLOCK
VDD
GND
LD
FIN
520MHZ
IC205
IC205 SC74HCU04 BUFFER
R341 1k
C343 0.1 B
C342 0.01 B
TCXO
TCXO201 18.414MHZ
C340 22 6.3V
C341 0.01 B
R342 2.2k



Note :

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- All resistors are in Ω and ¼W or less unless otherwise specified.
- ▬▬ : B+ Line
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- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : POWER ON
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.

【KDU SUB BOARD】

【KDU BOARD】

Q11 2SC2712-TE85L REVERSE CURRENT PREVENTION

IC2 S-8054AL RESET-DET

IC4 DC-DC CONVERTER SCI7660C/M

Q12 DTC143ZU BUZZER DRIVE

IC7 CHIP SELECT DECODER SN74HC139NS-T1

IC6 64KX8BIT OTP ROM MBM27C512

IC8 H8/532 HD6435328F (MASK-ROM) SYSTEM-CONTROL MICRO-COMPUTER-UNIT

IC9 CMOS SRAM 2KX8BIT CXK5816MS-15L

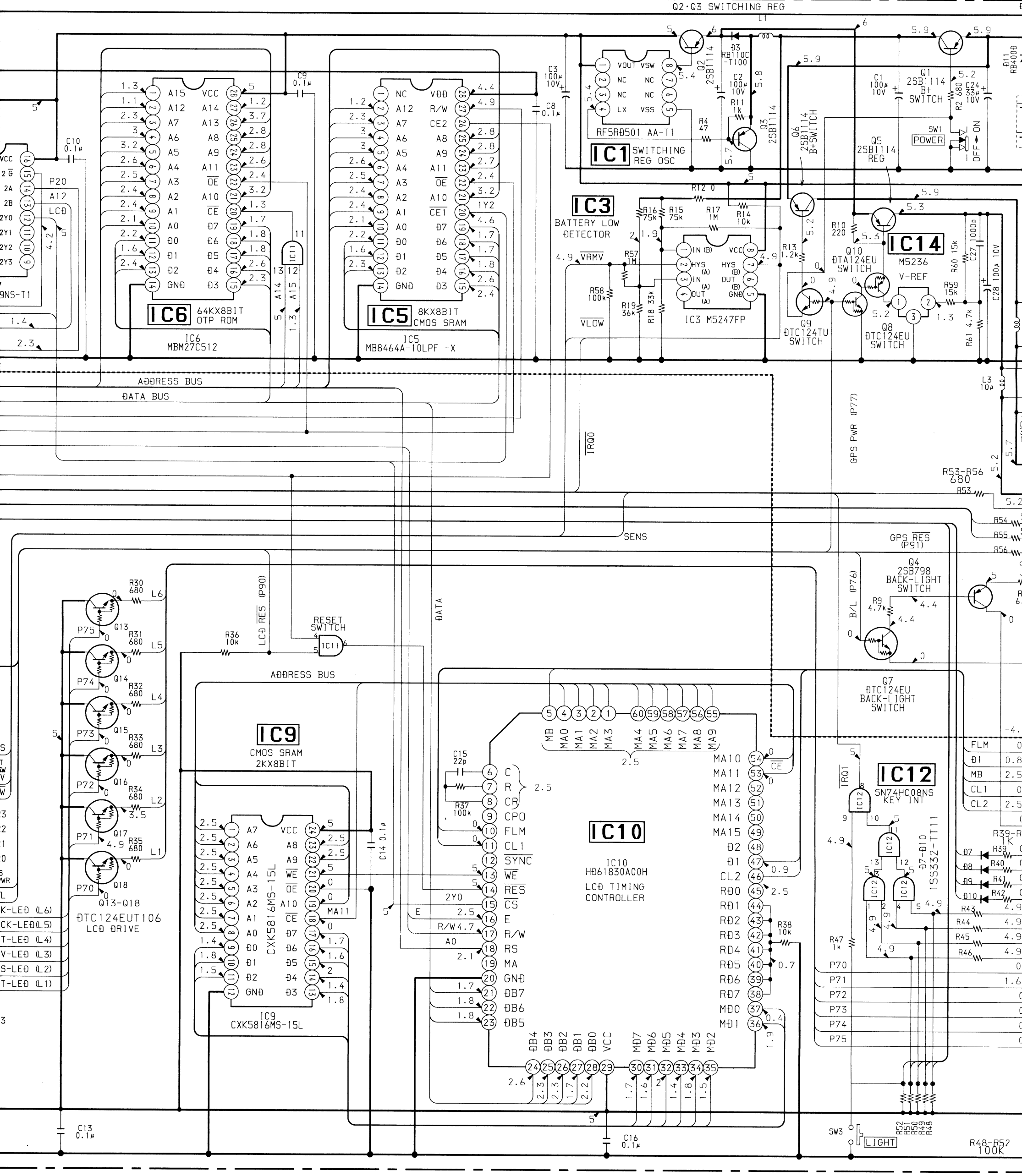
Q13-Q18 DTC124EUT106 LCD DRIVE

RESET SWITCH

ADDRESS BUS

DATA BUS

Q2·Q3 SWITCHING REG



Q2·Q3 SWITCHING REG
L1
Đ1 RB400Đ
Đ3 RB110C-T100
Q2 2SB1114
Đ11 RB400Đ
J1
ĐC IN 6V
ĐRY BATTERY SIZE"AA" IEC ĐESIGNATION R6 4PCS 6V
C3 100µ 10V
C8 0.1µ
C2 100µ 10V
C1 100µ 10V
Q1 2SB1114 B+ SWITCH
R2 680
C24 33µ 10V
SW1 POWER
OFF ON
R11 1k
R4 47
Q3 2SB1114
Q6 2SB1114 B+SWITCH
Q5 2SB1114 REG
RF5RĐ501 AA-T1
VOUT VSW
NC NC
NC NC
LX VSS
IC1 SWITCHING REG OSC
R12 0
IC3 BATTERY LOW ĐETECTOR
R16 75k
R15 75k
R17 1M
R14 10k
R13 1.2k
R10 220
Q10 ĐTA124EU SWITCH
IC14 M5236 V-REF
R60 15k
C27 1000p
C28 100µ 10V
R59 15k
R61 4.7k
R57 1M
R58 100k
R19 36k
R18 33k
IC3 M5247FP
IN (B) VCC
HYS (A) HYS (B)
IN (A) OUT (B)
OUT (A) GNĐ
VRMV
VLOW
Q9 ĐTC124TU SWITCH
Q8 ĐTC124EU SWITCH
C20 10000p
L2 100µ
C21 10000p
C22 10000p
L3 10µ
C23 10000p
C25 33µ 10V
C17 0.1µ
C18 0.1µ
VCC GNĐ
IC11 SN74HC08NS-T1
IC11 IC12
C19 0.1µ
VCC OUT
NC IN GNĐ
IC13 SC7S04FER
CN2
CNC301
9 GNĐ (シールド)
8 GNĐ
7 VRF
6 NC
5 VĐIG
4 SENS
3 TXĐ
2 RXĐ
1 RES
B
TO ĐIGITAL BOARĐ CN102
R53-R56 680
R53
R54
R55
R56
R7 6.8
R9 4.7k
Q4 2SB798 BACK-LIGHT SWITCH
B/L (P76)
GPS RES (P91)
GPS PWR (P77)
SENS
IRQ0
ĐATA
Q7 ĐTC124EU BACK-LIGHT SWITCH
CN3 IL-402-24S-S1L-S
1 VSS (GNĐ)
2 VĐĐ (5V)
3 VEE (-5V)
4 FLM
5 LĐATA1 (Đ1)
6 M (MB)
7 CLKLA (CL1)
8 CLKSR (CL2)
9 B/L
10
11 KS0
12 KS1
13 KS2
14 KS3
15 KR0
16 KR1
17 KR2
18 KR3
19 L1 (SET-LEĐ)
20 L2 (POS-LEĐ)
21 L3 (NAV-LEĐ)
22 L4 (EĐT-LEĐ)
23 L5 (TRCK-LEĐ)
24 L6 (MRK-LEĐ)
FLM 0
Đ1 0.8
MB 2.5
CL1 0
CL2 2.5
0
R39-R46 1K
Đ7 R39 0
Đ8 R40 0
Đ9 R41 0
Đ10 R42 0
R43 4.9
R44 4.9
R45 4.9
R46 4.9
P70 0
P71 1.6
P72 0
P73 0
P74 0
P75 0
IC12 SN74HC08NS KEY INT
IRQ1
Đ7-Đ10 1SS332-TT11
R47 1k
R48-R52 100K
SW3 LIGHT
IC10 HĐ61830A00H LCĐ TIMING CONTROLLER
MB MA0 MA1 MA2 MA3 MA4 MA5 MA6 MA7 MA8 MA9
MA10 MA11 MA12 MA13 MA14 MA15
Đ2 Đ1 CL2 RĐ0 RĐ1 RĐ2 RĐ3 RĐ4 RĐ5 RĐ6 RĐ7 MĐ0 MĐ1
C15 22p
R37 100k
C
R
CR
CPO
FLM
CL1
SYNC
WE
RES
CS
E
R/W
RS
MA
GNĐ
ĐB7
ĐB6
ĐB5
ĐB4 ĐB3 ĐB2 ĐB1 ĐB0 VCC
MĐ7 MĐ6 MĐ5 MĐ4 MĐ3 MĐ2
R38 10k
C16 0.1µ
R48 R49 R50 R51 R52
LCĐ BLOCK
SET POS NAV MRK
TRACK EĐIT
RCL CLR
EXT ENT
【LCD/KEY BOARD】
THIS UNIT IS SUPPLIEĐ AS THE ASSEMBLEĐ BLOCK

【DIGITAL BOARD】

IC107

IC107
CXK58267AM-70L
CMOS-32KX8BIT
HI-SPEED-SRAM

RAM
CXK58267AM-70L

Q102
2SC2712G-TE85L
B+SWITCH

D102
RB400D
-T146

BATT101
CR2450HW1
(BUCK-UP)

C109
0.1μ

IC106

IC106
AM27C512-95DI
CMOS-64KX8BIT
EP-ROM

C110
0.1μ

R109
470k

INT1

IC101

Z8018010FEC

IC101
8018010FEC
8BIT-CPU

MICRO COMPUTER

ADDRESS

RD
WR
CS

R108
10k

R105
10k

R106
10k

R107
10k

CLK
DATA
LATCH

IC102

IC102
MC74AC139
CHIP-SELECT
DECODER

74AC139SJ

RAM
CXD2901Q

C107
0.1μ

C108
0.1μ

RXD
TXD

IC106
AM27C512-95ÐI
IC106
AM27C512-95ÐI
CMOS-64KX8BIT
EP-ROM

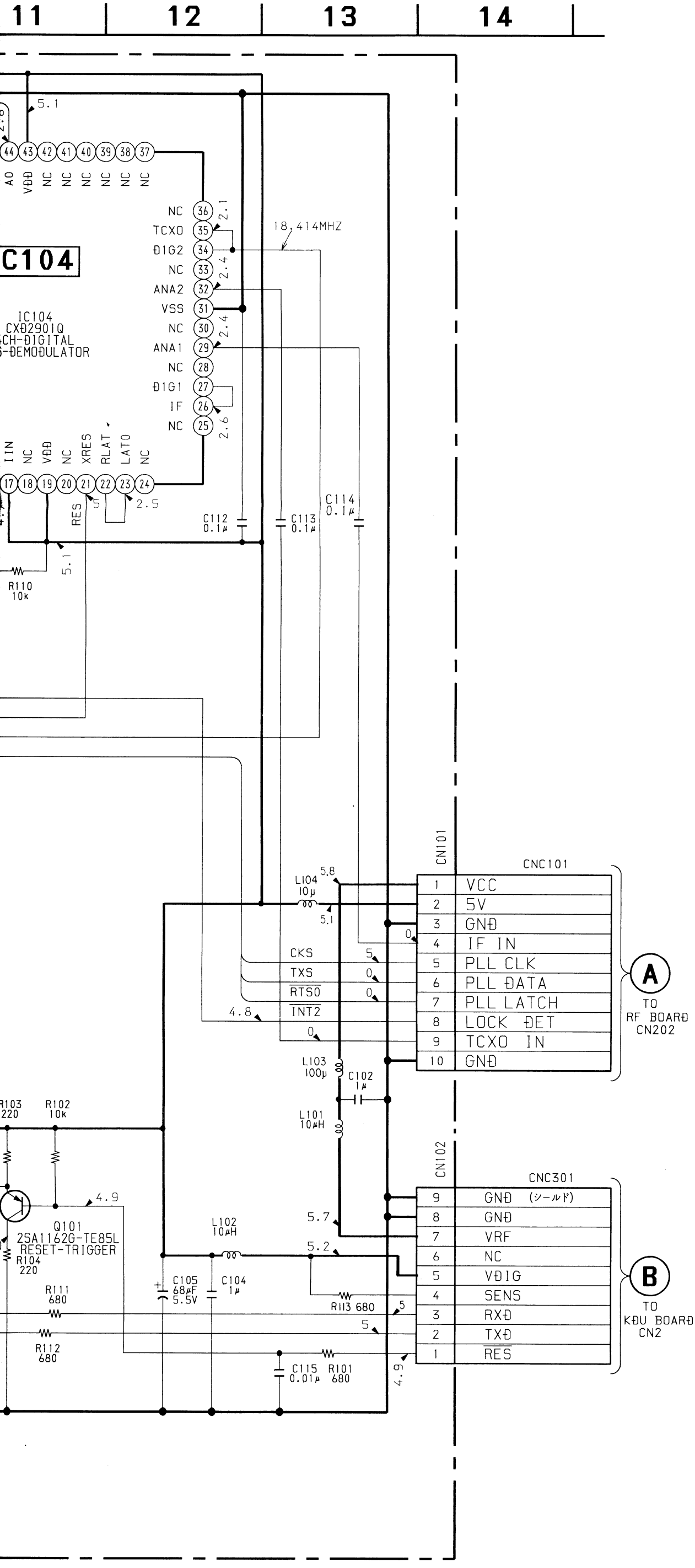
IC105
RTC62423A
REAL-TIME
CLOOK-ÐECOÐER

IC104
CXÐ2901Q
4CH-ÐIGITAL
GPS-ÐEMOÐULATOR

IC102
IC102
MC74AC139
CHIP-SELECT
ÐECOÐER

IC103
IC103
S-8054ALB-LM-T1
RESET-ÐET
OUT

R109 470k
R110 10k
C110 0.1µ
C111 0.1µ
C112 0.1µ
C113 0.1µ
C114 0.1µ
C107 0.1µ
C106 10µ 16V
C105 68µF 5.5V
C104 1µ
C115 0.01µ
R101 680
R102 10k
R103 220
R104 220
R111 680
R112 680
R113 680
L101 10µH
L102 10µH
L103 100µ
L104 10µ
C102 1µ
Ð101 ÐAN202K -T146
Q101 2SA1162G-TE85L RESET-TRIGGER
18.414MHZ
ÐATA
CLK
RXÐ
TXÐ
CKS
TXS
RTS0
INT2
INT1
RAM
CXÐ2901Q



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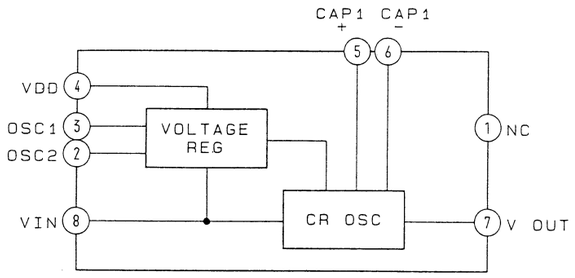
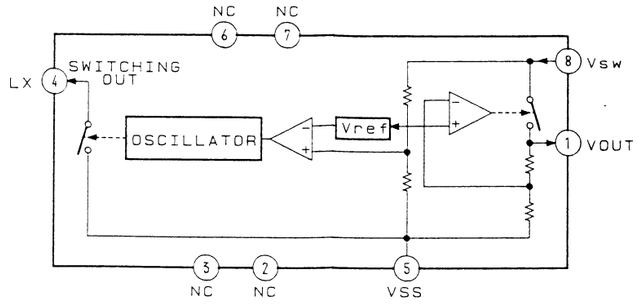
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	**Note:** Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

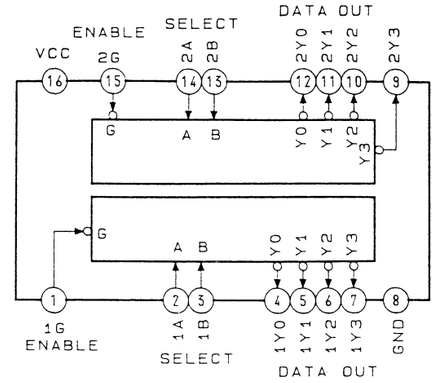
IC4, IC201 SC17660MOA



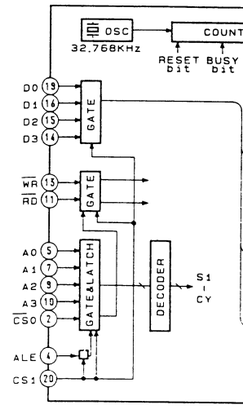
IC1 RF5RD501AA



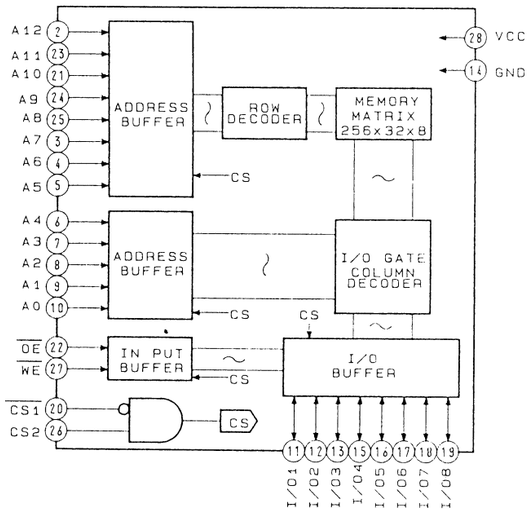
IC7, IC102 SN74HC139



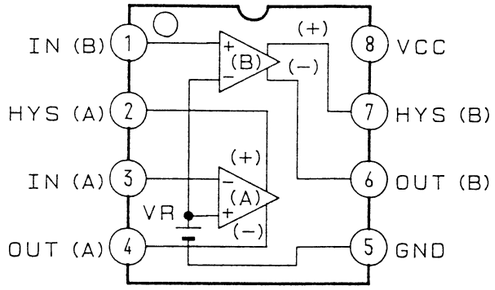
IC105 RTC62423A



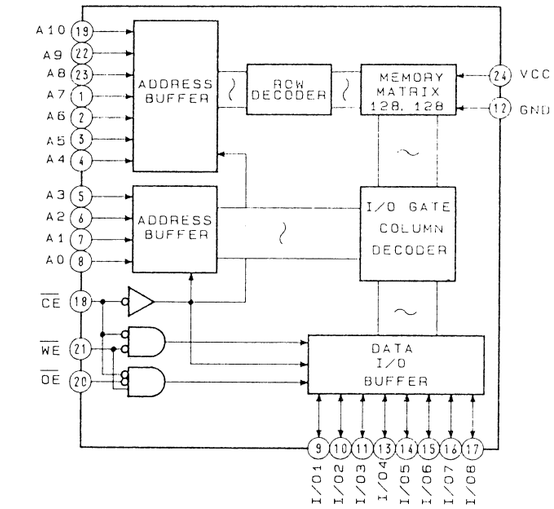
IC5 MB8464A



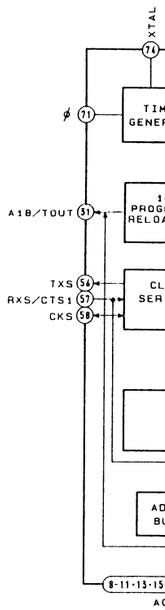
IC3 M5247FP



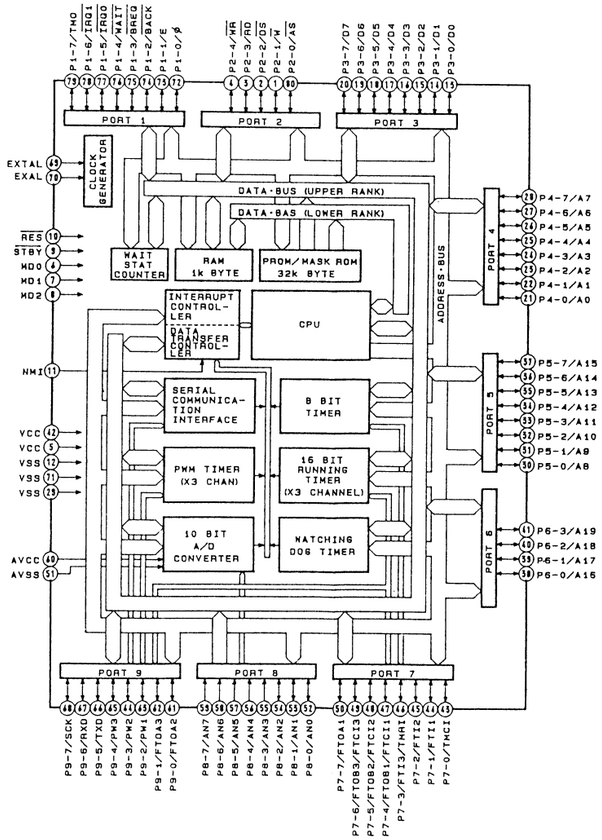
IC9 CXK5816MS



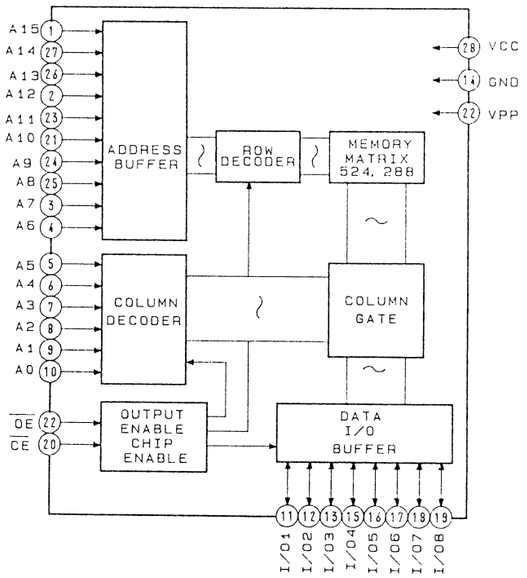
IC101 Z8018010



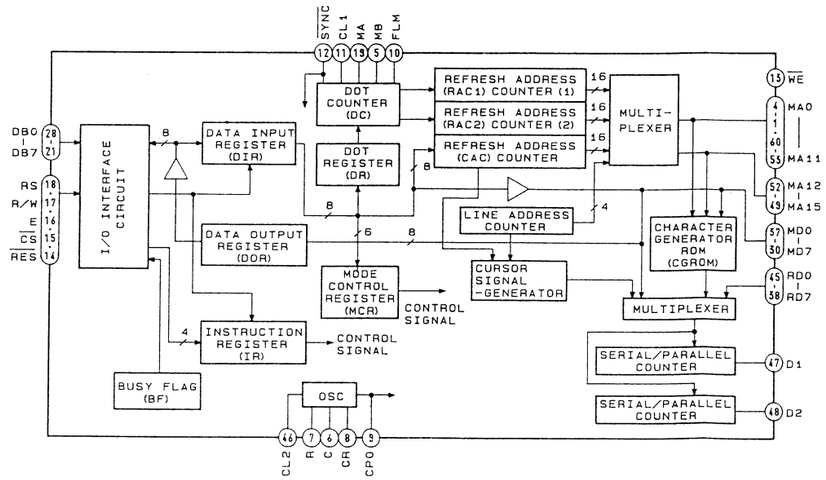
IC8 HD6435328RF00F



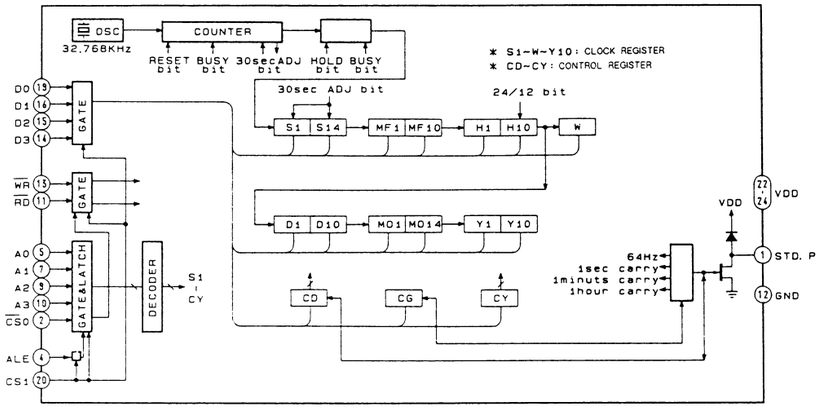
IC6 MBM27C512



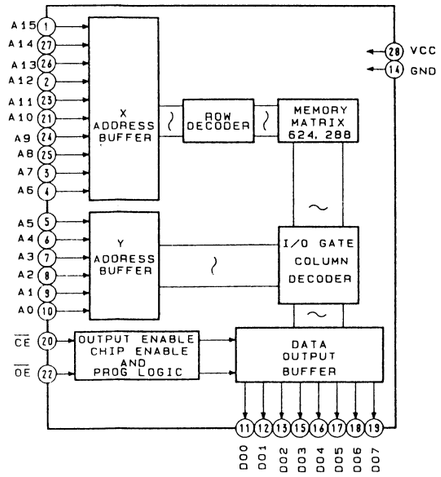
IC10 HD61830A00H



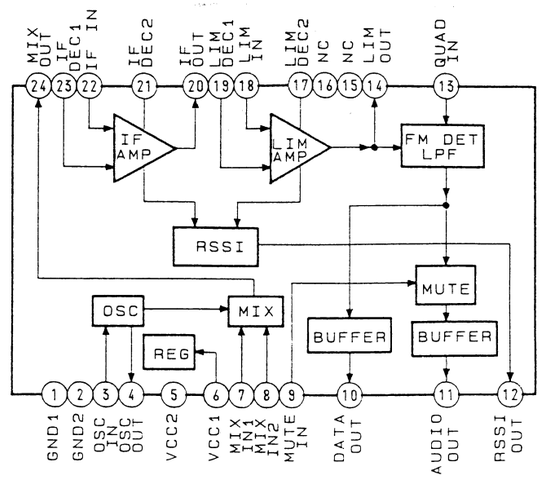
IC105 RTC62423A



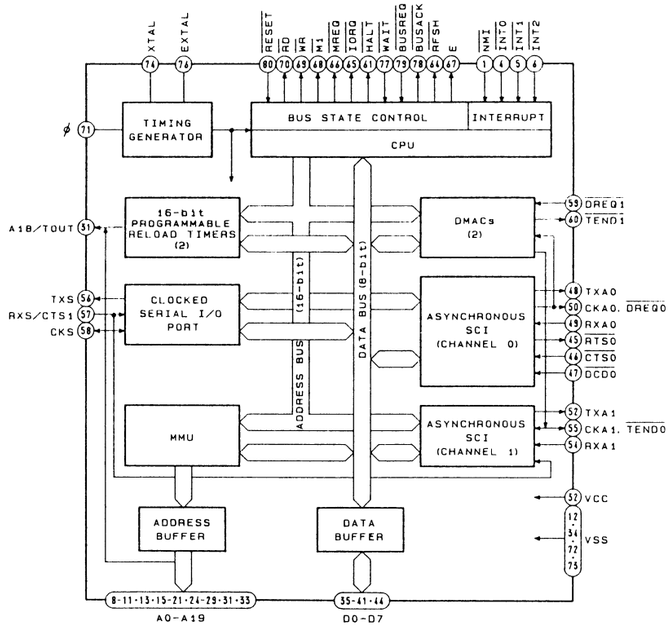
IC106 AM27C512


A15 A14 A13 A12 A11 A10 A9 A8 A7 A6 A5 A4 A3 A2 A1 A0
X ADDRESS BUFFER
ROW DECODER
MEMORY MATRIX 624, 288
Y ADDRESS BUFFER
I/O GATE COLUMN DECODER
CE OE
OUTPUT ENABLE CHIP ENABLE AND PROG LOGIC
DATA OUTPUT BUFFER
VCC GND
O00 O01 O02 O03 O04 O05 O06 O07

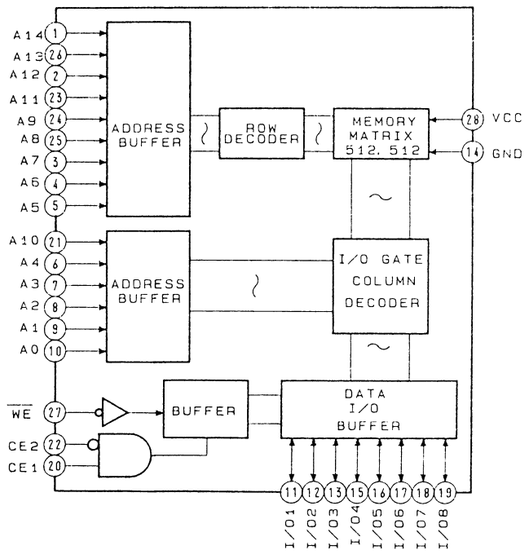
IC202 CXA1293



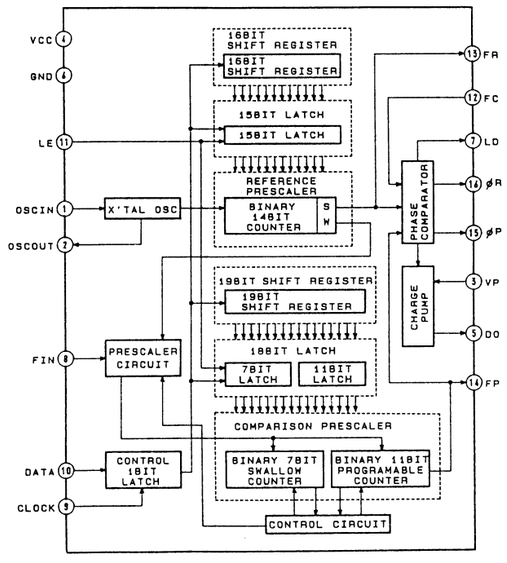
IC101 Z8018010FEC

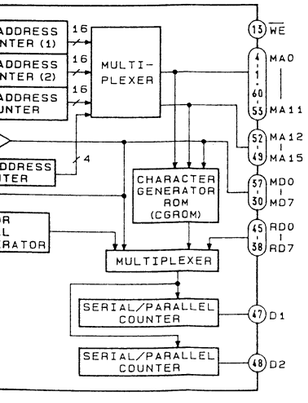

XTAL EXTAL RESET RD WR M1 MREQ IORQ HALT WAIT BUSREQ BUSACK RFSH E NMI INT0 INT1 INT2
TIMING GENERATOR
BUS STATE CONTROL
INTERRUPT
CPU
16-bit PROGRAMMABLE RELOAD TIMERS (2)
DMACs (2)
CLOCKED SERIAL I/O PORT
ASYNCHRONOUS SCI (CHANNEL 0)
ASYNCHRONOUS SCI (CHANNEL 1)
MMU
ADDRESS BUFFER
DATA BUFFER
ADDRESS BUS (16-bit)
DATA BUS (8-bit)
A18/TOUT TXS RXS/CTS1 CKS
DREQ1 TEND1 TXA0 CKA0. DREQ0 RXA0 RTS0 CTS0 DCD0 TXA1 CKA1. TEND0 RXA1 VCC VSS
A0-A19
D0-D7

IC107 CXK58267AM

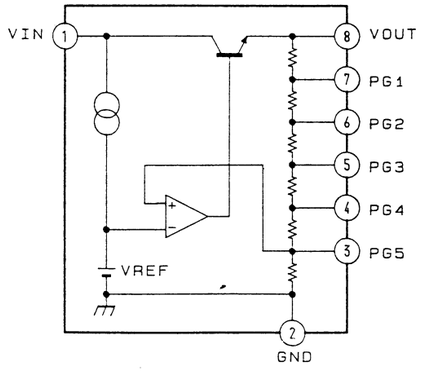

A14 A13 A12 A11 A9 A8 A7 A6 A5 A10 A4 A3 A2 A1 A0
ADDRESS BUFFER
ROW DECODER
MEMORY MATRIX 512, 512
ADDRESS BUFFER
I/O GATE COLUMN DECODER
WE CE2 CE1
BUFFER
DATA I/O BUFFER
VCC GND
I/O1 I/O2 I/O3 I/O4 I/O5 I/O6 I/O7 I/O8

IC203 MB1504





IC204 TK11701M



SECTION 5
EXPLODED VIEWS

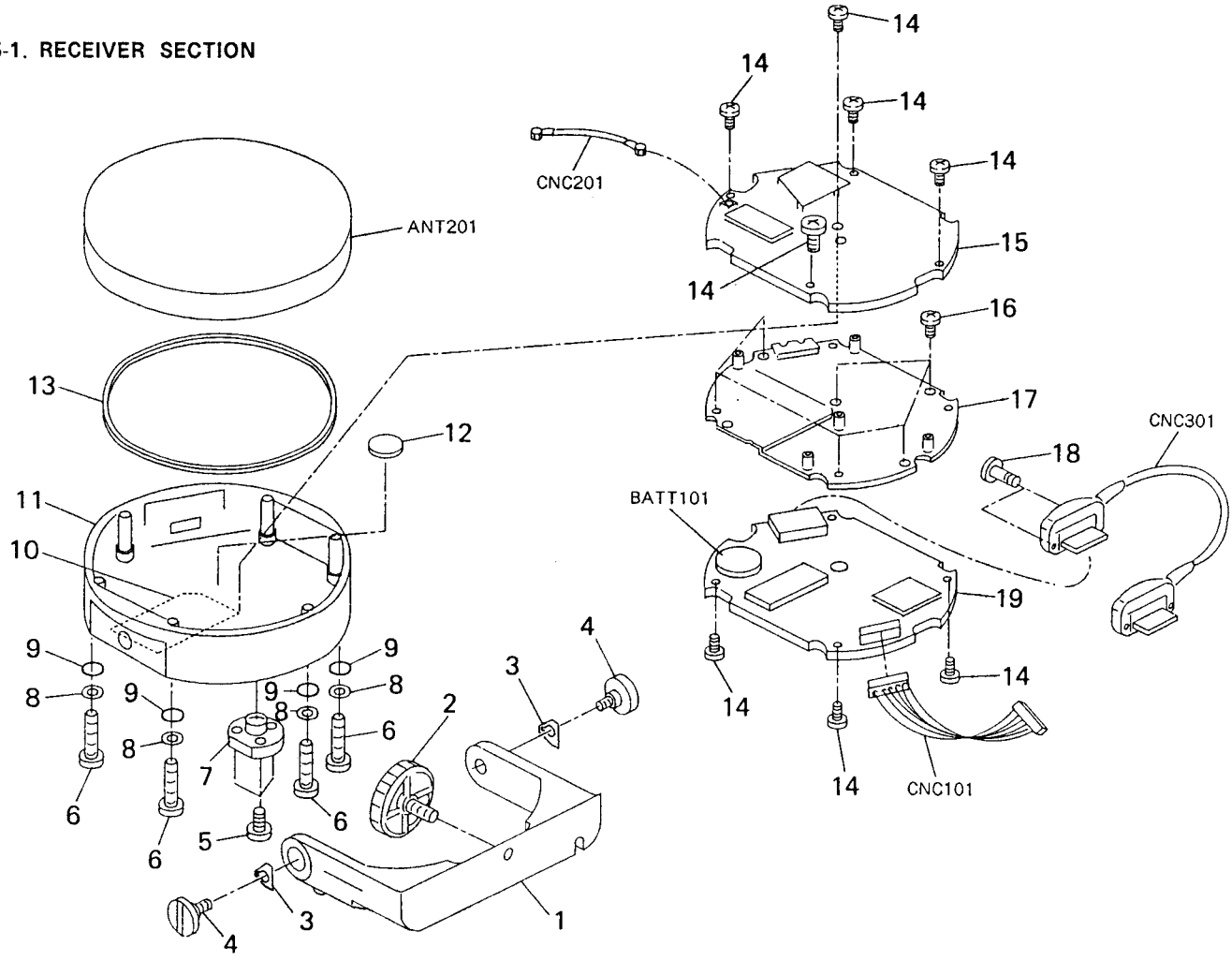
NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Color indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE)....(RED)
  ↑ ↑
  Parts color Cabinet's color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifé.

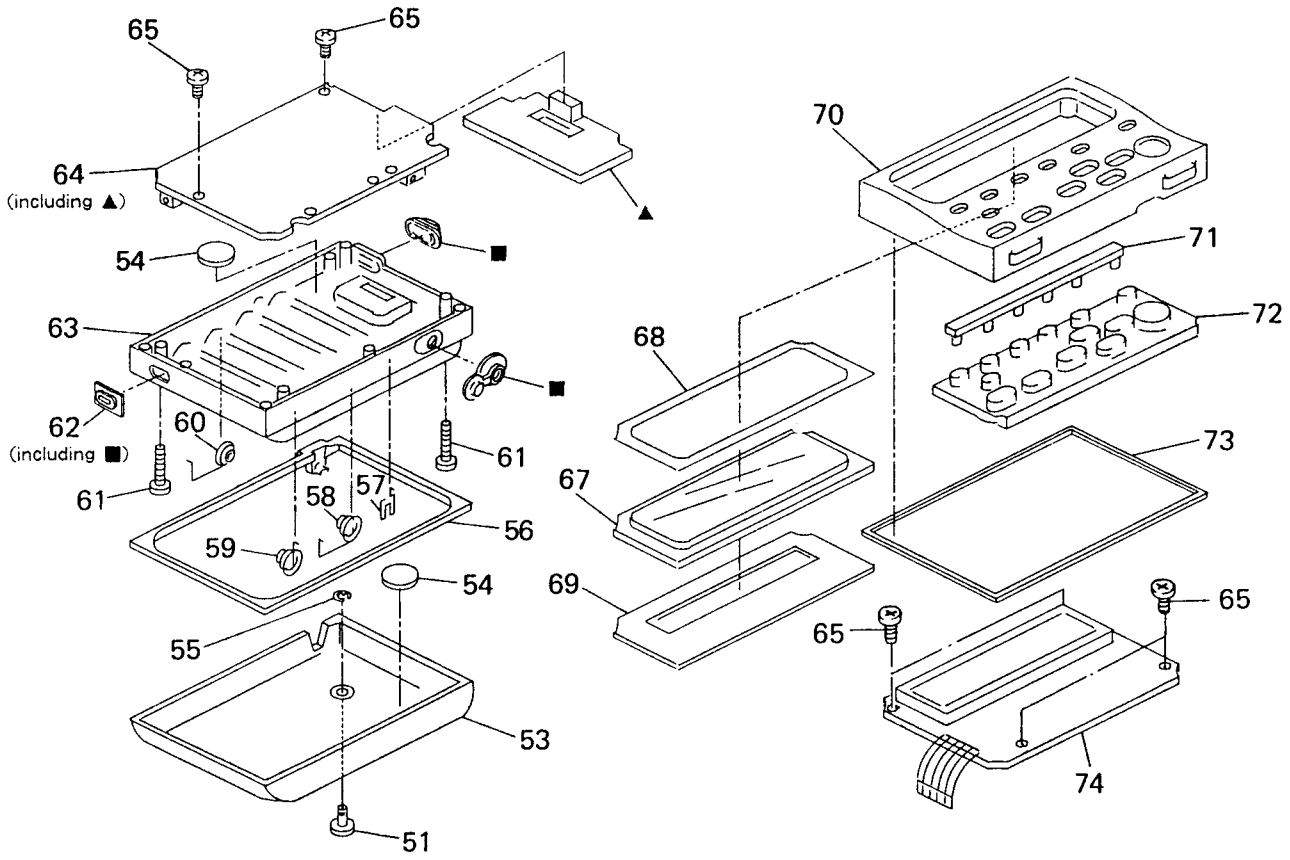
5-1. RECEIVER SECTION



Ref. No.	Part No.	Description	Remark
1	3-369-839-01	JOINT	
2	3-369-840-01	SCREW (JOINT), FITTING	
3	3-372-238-01	WASHER (ANT)	
4	3-369-841-01	SCREW (ANT), FITTING	
5	3-753-917-01	SCREW (2X4), TAPPING	
6	3-370-868-01	SCREW (CASE), FITTING	
7	3-371-583-01	SCREW (STAND), FITTING	
8	3-370-867-01	WASHER (CASE)	
9	3-326-560-02	RING (DIA. 2.5XDIA. 4.5), O	
10	* 3-371-904-01	LABEL, MODEL NUMBER (ANETNNA E)	
11	3-369-845-01	CASE (ANT)	
12	3-372-061-01	FILTER (ANT)	

Ref. No.	Part No.	Description	Remark
13	3-370-631-02	PACKING (ANT 2)	
14	* 2-640-315-01	SCREW (M2X5), SMALL, +P, SW	
15	* A-3679-258-A	RF BOARD, COMPLETE	
16	7-685-103-19	SCREW +P 2X5 TYPE2 SLIT	
17	* 3-369-843-01	CHASSIS (A)	
18	3-369-842-01	SCREW (CONNECTOR), FITTING	
19	* A-3661-305-A	DIGITAL BOARD, COMPLETE	
ANT201	1-501-506-21	ANTENNA	
BATT101 ⚠	1-528-229-31	BATTERY, LITHIUM (CR-2450)	
CNC101	1-590-947-11	CABLE (WITH CONNECTOR)	
CNC201	1-590-948-11	CABLE (WITH CONNECTOR) (RF)	
CNC301	1-590-946-11	CABLE (WITH CONNECTOR)	

5-2. DISPLAY SECTION



Ref. No.	Part No.	Description	Remark
51	3-369-865-01	SCREW, FITTING	
53	3-369-864-01	LID, BATTERY CASE	
54	3-372-061-01	FILTER (ANT)	
55	7-624-104-04	STOP RING 2.0, TYPE -E	
56	3-369-863-01	PACKING (C)	
57	3-369-859-01	TERMINAL, BATTERY	
58	3-369-862-01	SPRING (C), BATTERY COIL	
59	3-369-860-01	SPRING (A), BATTERY COIL	
60	3-369-861-01	SPRING (B), BATTERY COIL	
61	7-685-138-19	SCREW +P 2.6X16 TYPE2 SLIT	
62	3-369-858-01	BUTTON (PAIR)	

Ref. No.	Part No.	Description	Remark
63	3-369-857-01	CABINET (REAR)	
64	* A-3679-260-A	KDU BOARD, COMPLETE	
65	7-685-103-19	SCREW +P 2X5 TYPE2 SLIT	
67	3-369-851-01	PLATE, TRANSPARENT	
68	3-369-853-01	SHEET (A), ADHESIVE	
69	3-369-852-01	PLATE, BACK	
70	3-369-850-01	CABINET (FRONT)	
71	3-369-855-01	PLATE, LIGHT GUIDE	
72	3-369-854-01	BUTTON (KEY TOP)	
73	3-369-867-01	PACKING (A)	
74	1-809-398-11	DISPLAY PANEL, LIQUID CRYSTAL	

SECTION 6
ELECTRICAL PARTS LIST

DIGITAL KDU

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- −XX, −X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL : Metal-film resistor
  METAL OXIDE : Metal Oxide-film resistor
  F : nonflammable
- Items marked "＊" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA.... : μA...., uPA.... : μPA....
  uPB.... : μPB...., uPC.... : μPC....
  uPD.... : μPD....
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

Ref. No.	Part No.	Description			Remark
	＊ A-3661-305-A	DIGITAL BOARD, COMPLETE			
		**********			
	3-369-849-01	SHEET (CONNECTOR), ADHESIVE			
		< CAPACITOR >			
C102	1-162-638-11	CERAMIC CHIP	1uF		16V
C104	1-162-638-11	CERAMIC CHIP	1uF		16V
C105	1-128-338-11	ELECT CHIP	68uF		6.3V
C106	1-128-031-11	ELECT CHIP	10uF		16V
C107	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C108	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C109	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C110	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C111	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C112	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C113	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C114	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C115	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
		< CONNECTOR >			
CN101	1-573-221-21	PIN, CONNECTOR 10P			
CN102	1-573-215-11	JACK 9P			
		< DIODE >			
D101	8-719-400-18	DIODE	MA152WK		
D102	8-719-988-08	DIODE	RD400D		
		< IC >			
IC101	8-759-514-50	IC	Z8018010FEC		
IC102	8-759-039-10	IC	MC74AC139MR		
IC103	8-759-937-56	IC	S-8054ALB-LM-S		
IC104	8-752-338-37	IC	CXD2901Q		
IC105	8-759-518-55	IC	RTC-62423AL		
IC106	X-3363-319-1	IC	DIGITAL ROM ASSY		
IC107	8-752-337-82	IC	CXK58267AM-70L		
		< COIL >			
L101	1-412-032-11	INDUCTOR, CHIP 100uH			
L102	1-412-029-11	INDUCTOR, CHIP 10uH			
L103	1-412-032-11	INDUCTOR, CHIP 100uH			
L104	1-412-029-11	INDUCTOR, CHIP 10uH			
		< TRANSISTOR >			
Q101	8-729-216-22	TRANSISTOR	2SA1162-G		
Q102	8-729-230-49	TRANSISTOR	2SC2712-YG		
		< RESISTOR >			
R101	1-216-045-00	METAL CHIP	680	5%	1/10W
R102	1-216-073-00	METAL CHIP	10K	5%	1/10W
R103	1-216-033-00	METAL CHIP	220	5%	1/10W
R104	1-216-033-00	METAL CHIP	220	5%	1/10W
R105	1-216-073-00	METAL CHIP	10K	5%	1/10W
R106	1-216-073-00	METAL CHIP	10K	5%	1/10W
R107	1-216-073-00	METAL CHIP	10K	5%	1/10W
R108	1-216-073-00	METAL CHIP	10K	5%	1/10W
R109	1-216-113-00	METAL CHIP	470K	5%	1/10W
R110	1-216-073-00	METAL CHIP	10K	5%	1/10W
R111	1-216-045-00	METAL CHIP	680	5%	1/10W
R112	1-216-045-00	METAL CHIP	680	5%	1/10W
R113	1-216-045-00	METAL CHIP	680	5%	1/10W
**********					
	＊ A-3679-260-A	KDU BOARD, COMPLETE			
		**********			
		< BUZZER >			
BZ1	1-529-099-11	BUZZER			

KDU

Ref. No.	Part No.	Description			Remark
		< CAPACITOR >			
C1	1-128-393-11	ELECT	100uF	20% 10V	
C2	1-128-393-11	ELECT	100uF	20% 10V	
C3	1-128-393-11	ELECT	100uF	20% 10V	
C4	1-126-394-11	ELECT CHIP	10uF	20% 16V	
C5	1-126-394-11	ELECT CHIP	10uF	20% 16V	
C6	1-126-390-11	ELECT CHIP	22uF	20% 6.3V	
C7	1-125-486-11	DUBLE LAYERS	0.22F	5.5V	
C8	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C9	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C10	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C11	1-162-943-11	CERAMIC CHIP	15PF	5% 50V	
C12	1-162-943-11	CERAMIC CHIP	15PF	5% 50V	
C13	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C14	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C15	1-162-945-11	CERAMIC CHIP	22PF	5% 50V	
C16	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C17	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C18	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C19	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C20	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	
C21	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	
C22	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	
C23	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	
C24	1-126-393-11	ELECT CHIP	33uF	20% 10V	
C25	1-126-393-11	ELECT CHIP	33uF	20% 10V	
C27	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C28	1-128-393-11	ELECT	100uF	20% 10V	
		< CONNECTOR >			
CN2	1-573-216-11	JACK 9P			
CN3	1-573-217-21	CONNECTOR, FPC (NON-ZIF) 24P			
CN4	1-573-219-11	PIN, CONNECTOR 10P			
CN5	1-573-220-11	PIN, CONNECTOR 10P			
		< DIODE >			
D1	8-719-988-08	DIODE	RD400D		
D2	8-719-105-91	DIODE	RD5.6M-B2		
D3	8-719-975-33	DIODE	RB110C		
D4	8-719-976-31	DIODE	1SS332		
D6	8-719-976-31	DIODE	1SS332		
D7	8-719-976-31	DIODE	1SS332		
D8	8-719-976-31	DIODE	1SS332		
D9	8-719-976-31	DIODE	1SS332		
D10	8-719-976-31	DIODE	1SS332		
D11	8-719-988-08	DIODE	RD400D		

Ref. No.	Part No.	Description			Remark
		< IC >			
IC1	8-759-503-44	IC	RF5RD501AC		
IC2	8-759-937-56	IC	S-8054ALB-LM-S		
IC3	8-759-630-68	IC	M5247FP		
IC4	8-759-513-52	IC	SCI7660MOA		
IC5	8-759-513-58	IC	MB8464A-10LLPF-X		
IC6	X-3363-320-1	IC	KDU ROM ASSY		
IC7	8-759-926-12	IC	SN74HC139ANS		
IC8	8-759-323-88	IC	HD6435328RA00F		
IC9	8-759-805-49	IC	CXK5816MS-15L		
IC10	8-759-323-69	IC	HD61830A00H		
IC11	8-759-925-76	IC	SN74HC08ANS		
IC12	8-759-925-76	IC	SN74HC08ANS		
IC13	8-759-031-58	IC	SC7SU04F		
IC14	8-759-630-27	IC	M5236ML		
		< JACK >			
J1	1-573-180-11	JACK, DC (DC IN 6V)			
		< COIL >			
L1	1-424-527-11	COIL, CHOKE			
L2	1-412-032-11	INDUCTOR, CHIP 100uH			
L3	1-412-029-11	INDUCTOR, CHIP 10uH			
		< TRANSISTOR >			
Q1	8-729-805-25	TRANSISTOR	2SB1121-S		
Q2	8-729-805-25	TRANSISTOR	2SB1121-S		
Q3	8-729-805-25	TRANSISTOR	2SB1121-S		
Q4	8-729-101-07	TRANSISTOR	2SB798-DL		
Q5	8-729-805-25	TRANSISTOR	2SB1121-S		
Q6	8-729-805-25	TRANSISTOR	2SB1121-S		
Q7	8-729-905-61	TRANSISTOR	DTC124EU		
Q8	8-729-905-61	TRANSISTOR	DTC124EU		
Q9	8-729-924-50	TRANSISTOR	DTC124TU		
Q10	8-729-905-57	TRANSISTOR	DTA124EU		
Q11	8-729-230-49	TRANSISTOR	2SC2712-YG		
Q12	8-729-905-61	TRANSISTOR	DTC124EU		
Q13	8-729-905-61	TRANSISTOR	DTC124EU		
Q14	8-729-905-61	TRANSISTOR	DTC124EU		
Q15	8-729-905-61	TRANSISTOR	DTC124EU		
Q16	8-729-905-61	TRANSISTOR	DTC124EU		
Q17	8-729-905-61	TRANSISTOR	DTC124EU		
Q18	8-729-905-61	TRANSISTOR	DTC124EU		
		< RESISTOR >			
R1	1-216-837-11	METAL CHIP	22K	5% 1/16W	
R2	1-216-819-11	METAL CHIP	680	5% 1/16W	
R3	1-216-833-11	METAL CHIP	10K	5% 1/16W	

Ref. No.	Part No.	Description			Remark
R4	1-216-805-11	METAL CHIP	47	5%	1/16W
R5	1-216-813-11	METAL CHIP	220	5%	1/16W
R6	1-216-813-11	METAL CHIP	220	5%	1/16W
R7	1-216-311-00	METAL CHIP	6.8	5%	1/10W
R8	1-216-845-11	METAL CHIP	100K	5%	1/16W
R9	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W
R10	1-216-813-11	METAL CHIP	220	5%	1/16W
R11	1-216-821-11	METAL CHIP	1K	5%	1/16W
R12	1-216-864-11	METAL CHIP	0		
R13	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R14	1-216-833-11	METAL CHIP	10K	5%	1/16W
R15	1-218-737-91	METAL CHIP	75K	0.50%	1/16W
R16	1-218-737-91	METAL CHIP	75K	0.50%	1/16W
R17	1-216-857-11	METAL CHIP	1M	5%	1/16W
R18	1-216-839-11	METAL CHIP	33K	5%	1/16W
R19	1-218-729-91	METAL CHIP	36K	0.50%	1/16W
R20	1-216-857-11	METAL CHIP	1M	5%	1/16W
R21	1-216-845-11	METAL CHIP	100K	5%	1/16W
R22	1-216-845-11	METAL CHIP	100K	5%	1/16W
R23	1-216-833-11	METAL CHIP	10K	5%	1/16W
R24	1-216-833-11	METAL CHIP	10K	5%	1/16W
R25	1-216-833-11	METAL CHIP	10K	5%	1/16W
R26	1-216-833-11	METAL CHIP	10K	5%	1/16W
R27	1-216-833-11	METAL CHIP	10K	5%	1/16W
R28	1-216-833-11	METAL CHIP	10K	5%	1/16W
R29	1-216-833-11	METAL CHIP	10K	5%	1/16W
R30	1-216-819-11	METAL CHIP	680	5%	1/16W
R31	1-216-819-11	METAL CHIP	680	5%	1/16W
R32	1-216-819-11	METAL CHIP	680	5%	1/16W
R33	1-216-819-11	METAL CHIP	680	5%	1/16W
R34	1-216-819-11	METAL CHIP	680	5%	1/16W
R35	1-216-819-11	METAL CHIP	680	5%	1/16W
R36	1-216-833-11	METAL CHIP	10K	5%	1/16W
R37	1-216-845-11	METAL CHIP	100K	5%	1/16W
R38	1-216-833-11	METAL CHIP	10K	5%	1/16W
R39	1-216-821-11	METAL CHIP	1K	5%	1/16W
R40	1-216-821-11	METAL CHIP	1K	5%	1/16W
R41	1-216-821-11	METAL CHIP	1K	5%	1/16W
R42	1-216-821-11	METAL CHIP	1K	5%	1/16W
R43	1-216-821-11	METAL CHIP	1K	5%	1/16W
R44	1-216-821-11	METAL CHIP	1K	5%	1/16W
R45	1-216-821-11	METAL CHIP	1K	5%	1/16W
R46	1-216-821-11	METAL CHIP	1K	5%	1/16W
R47	1-216-821-11	METAL CHIP	1K	5%	1/16W
R48	1-216-845-11	METAL CHIP	100K	5%	1/16W
R49	1-216-845-11	METAL CHIP	100K	5%	1/16W
R50	1-216-845-11	METAL CHIP	100K	5%	1/16W
R51	1-216-845-11	METAL CHIP	100K	5%	1/16W
R52	1-216-845-11	METAL CHIP	100K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R53	1-216-819-11	METAL CHIP	680	5%	1/16W
R54	1-216-819-11	METAL CHIP	680	5%	1/16W
R55	1-216-819-11	METAL CHIP	680	5%	1/16W
R56	1-216-819-11	METAL CHIP	680	5%	1/16W
R57	1-216-857-11	METAL CHIP	1M	5%	1/16W
R58	1-216-845-11	METAL CHIP	100K	5%	1/16W
R59	1-216-835-11	METAL CHIP	15K	5%	1/16W
R60	1-216-835-11	METAL CHIP	15K	5%	1/16W
R61	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W
R63	1-216-845-11	METAL CHIP	100K	5%	1/16W
		< SWITCH >			
SW1	1-554-439-00	SWITCH, PUSH (1 KEY) (POWER)			
SW2	1-570-282-21	SWITCH, KEY BOARD (RESET)			
SW3	1-554-088-00	SWITCH, KEY BOARD (LIGHT)			
		< VIBRATOR >			
X1	1-579-356-21	VIBRATOR, CRYSTAL (12.288MHz)			
**********					
*	A-3679-258-A	RF BOARD, COMPLETE			
		**********			
		< FILTER >			
BPF201	1-239-106-11	ENCAPSULATED COMPONENT (BPF) (1575.42MHz)			
BPF202	1-239-105-11	ENCAPSULATED COMPONENT (BPF) (1555.983MHz)			
		< CAPACITOR >			
C201	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C202	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C203	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C204	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C205	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C206	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C207	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C208	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C209	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C210	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C211	1-164-830-11	CERAMIC CHIP	1uF	22%	16V
C212	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C213	1-164-830-11	CERAMIC CHIP	1uF	22%	16V
C214	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C215	1-126-390-11	ELECT CHIP	22uF	20%	6.3V
C216	1-126-390-11	ELECT CHIP	22uF	20%	6.3V
C217	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C218	1-126-390-11	ELECT CHIP	22uF	20%	6.3V
C219	1-126-390-11	ELECT CHIP	22uF	20%	6.3V

RF

Ref. No.	Part No.	Description			Remark
C220	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C221	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C222	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C223	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C224	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C225	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C226	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C227	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C228	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C231	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C232	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C240	1-126-390-11	ELECT CHIP	22uF	20%	6.3V
C241	1-137-306-11	FILM CHIP	0.1uF	5%	16V
C242	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C243	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C244	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C245	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C246	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C247	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C248	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C249	1-162-932-11	CERAMIC CHIP	2PF	0.25PF	50V
C250	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C251	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C252	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C253	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C254	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C255	1-162-932-11	CERAMIC CHIP	2PF	0.25PF	50V
C256	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C257	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C258	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C259	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C260	1-137-306-11	FILM CHIP	0.1uF	5%	16V
C261	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C262	1-162-938-11	CERAMIC CHIP	7PF	0.5PF	50V
C263	1-162-936-11	CERAMIC CHIP	5PF	0.25PF	50V
C264	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C265	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C266	1-126-390-11	ELECT CHIP	22uF	20%	6.3V
C267	1-162-932-11	CERAMIC CHIP	2PF	0.25PF	50V
C268	1-162-934-11	CERAMIC CHIP	3PF	0.25PF	50V
C269	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C270	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C271	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C272	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C273	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C274	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C275	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C276	1-162-936-11	CERAMIC CHIP	5PF	0.25PF	50V
C277	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V

Ref. No.	Part No.	Description			Remark
C278	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C279	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C280	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C281	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C282	1-162-935-11	CERAMIC CHIP	4PF	0.25PF	50V
C290	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C291	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C292	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C293	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C294	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C295	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C296	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C297	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C298	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C299	1-162-935-11	CERAMIC CHIP	4PF	0.25PF	50V
C300	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C301	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C302	1-162-934-11	CERAMIC CHIP	3PF	0.25PF	50V
C303	1-162-934-11	CERAMIC CHIP	3PF	0.25PF	50V
C304	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C305	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C306	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C310	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C311	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C312	1-137-306-11	FILM CHIP	0.1uF	5%	16V
C313	1-126-391-11	ELECT CHIP	47uF	20%	6.3V
C314	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C315	1-137-296-11	FILM CHIP	0.015uF	5%	16V
C316	1-126-390-11	ELECT CHIP	22uF	20%	6.3V
C317	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C318	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C319	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C320	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C330	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C331	1-135-148-21	TANTAL. CHIP	1.5uF	20%	10V
C332	1-126-392-11	ELECT CHIP	100uF	20%	6.3V
C333	1-137-306-11	FILM CHIP	0.1uF	5%	16V
C334	1-126-396-11	ELECT CHIP	47uF	20%	16V
C335	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C336	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C337	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C338	1-126-392-11	ELECT CHIP	100uF	20%	6.3V
C339	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C340	1-126-390-11	ELECT CHIP	22uF	20%	6.3V
C341	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C342	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C343	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
CN201	1-573-223-21	PIN, CONNECTOR	
CN202	1-573-221-21	PIN, CONNECTOR 10P	
		< DIODE >	
D201	8-719-941-86	DIODE DAN202U	
D220	8-719-988-37	DIODE HVU350-ITRF	
D221	8-719-941-86	DIODE DAN202U	
D222	8-719-941-86	DIODE DAN202U	
		< IC >	
IC201	8-759-513-52	IC SCI7660MOA	
IC202	8-752-034-65	IC CXA1293M	
IC203	8-759-500-34	IC MB1504PF	
IC204	8-759-518-20	IC TK11701M	
IC205	8-759-927-29	IC SN74HCU04ANS	
IC206	8-759-031-58	IC SC7SU04F	
		< TRANSFORMER >	
IFT201	1-404-967-11	TRANSFORMER, IF	
		< COIL >	
L201	1-410-799-21	INDUCTOR CHIP 0.02uH	
L210	1-410-795-21	INDUCTOR CHIP 0.01uH	
L211	1-410-393-11	INDUCTOR CHIP 100uH	
L213	1-410-393-11	INDUCTOR CHIP 100uH	
L215	1-410-393-11	INDUCTOR CHIP 100uH	
L216	1-410-393-11	INDUCTOR CHIP 100uH	
L217	1-410-389-31	INDUCTOR CHIP 47uH	
L218	1-410-389-31	INDUCTOR CHIP 47uH	
L219	1-460-167-21	COIL (WITH CORE)	
L220	1-410-369-11	INDUCTOR CHIP 1uH	
L221	1-410-807-11	INDUCTOR CHIP 0.1uH	
L222	1-410-807-11	INDUCTOR CHIP 0.1uH	
L223	1-410-807-11	INDUCTOR CHIP 0.1uH	
L224	1-410-807-11	INDUCTOR CHIP 0.1uH	
L225	1-410-807-11	INDUCTOR CHIP 0.1uH	
L226	1-410-807-11	INDUCTOR CHIP 0.1uH	
L227	1-410-807-11	INDUCTOR CHIP 0.1uH	
L228	1-410-799-21	INDUCTOR CHIP 0.02uH	
L229	1-410-795-21	INDUCTOR CHIP 0.01uH	
L230	1-410-799-21	INDUCTOR CHIP 0.02uH	
L231	1-410-795-21	INDUCTOR CHIP 0.01uH	
L232	1-410-795-21	INDUCTOR CHIP 0.01uH	
L233	1-410-807-11	INDUCTOR CHIP 0.1uH	
L234	1-410-393-11	INDUCTOR CHIP 100uH	
L240	1-412-032-11	INDUCTOR CHIP 100uH	
L241	1-412-032-11	INDUCTOR CHIP 100uH	
L242	1-410-393-11	INDUCTOR CHIP 100uH	
L243	1-410-393-11	INDUCTOR CHIP 100uH	
		< TRANSISTOR >	
Q201	8-729-926-50	TRANSISTOR FHX35LG	
Q202	8-765-920-10	TRANSISTOR 3SK166-2	
Q203	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q210	8-765-910-10	TRANSISTOR 3SK165-1	
Q211	8-729-809-76	TRANSISTOR 2SC3142-J3	
Q220	8-729-429-89	TRANSISTOR 2SC3829	
Q221	8-729-429-89	TRANSISTOR 2SC3829	
Q222	8-729-429-89	TRANSISTOR 2SC3829	
Q223	8-729-429-89	TRANSISTOR 2SC3829	
Q224	8-729-429-89	TRANSISTOR 2SC3829	
Q225	8-729-118-73	TRANSISTOR 2SC3585-R44	
Q226	8-729-118-73	TRANSISTOR 2SC3585-R44	
Q227	8-729-118-73	TRANSISTOR 2SC3585-R44	
Q230	8-729-220-93	TRANSISTOR 2SK209-G	
Q231	8-729-402-84	TRANSISTOR XN4601	
Q232	8-729-402-84	TRANSISTOR XN4601	
		< RESISTOR >	
R201	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R202	1-216-809-11	METAL CHIP 100 5% 1/16W	
R203	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R204	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R205	1-216-817-11	METAL CHIP 470 5% 1/16W	
R206	1-216-797-11	METAL CHIP 10 5% 1/16W	
R207	1-216-817-11	METAL CHIP 470 5% 1/16W	
R208	1-216-817-11	METAL CHIP 470 5% 1/16W	
R209	1-216-797-11	METAL CHIP 10 5% 1/16W	
R210	1-216-817-11	METAL CHIP 470 5% 1/16W	
R211	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R212	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R213	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R214	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R215	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R216	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R217	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R218	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R219	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R220	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R221	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R222	1-216-809-11	METAL CHIP 100 5% 1/16W	
R223	1-216-805-11	METAL CHIP 47 5% 1/16W	
R230	1-216-806-11	METAL GLAZE 56 5% 1/16W	
R231	1-216-805-11	METAL CHIP 47 5% 1/16W	

RF

Ref. No.	Part No.	Description			Remark
R232	1-216-821-11	METAL CHIP	1K	5%	1/16W
R233	1-216-833-11	METAL CHIP	10K	5%	1/16W
R234	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R235	1-216-840-11	METAL CHIP	39K	5%	1/16W
R236	1-216-837-11	METAL CHIP	22K	5%	1/16W
R237	1-216-817-11	METAL CHIP	470	5%	1/16W
R238	1-216-805-11	METAL CHIP	47	5%	1/16W
R239	1-216-817-11	METAL CHIP	470	5%	1/16W
R240	1-216-833-11	METAL CHIP	10K	5%	1/16W
R245	1-216-805-11	METAL CHIP	47	5%	1/16W
R246	1-216-809-11	METAL CHIP	100	5%	1/16W
R247	1-216-857-11	METAL CHIP	1M	5%	1/16W
R248	1-216-797-11	METAL CHIP	10	5%	1/16W
R249	1-216-809-11	METAL CHIP	100	5%	1/16W
R250	1-216-833-11	METAL CHIP	10K	5%	1/16W
R251	1-216-821-11	METAL CHIP	1K	5%	1/16W
R252	1-216-821-11	METAL CHIP	1K	5%	1/16W
R254	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R255	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R256	1-216-811-11	METAL CHIP	150	5%	1/16W
R257	1-216-805-11	METAL CHIP	47	5%	1/16W
R258	1-216-821-11	METAL CHIP	1K	5%	1/16W
R259	1-216-837-11	METAL CHIP	22K	5%	1/16W
R260	1-216-837-11	METAL CHIP	22K	5%	1/16W
R261	1-216-813-11	METAL CHIP	220	5%	1/16W
R262	1-216-837-11	METAL CHIP	22K	5%	1/16W
R263	1-216-805-11	METAL CHIP	47	5%	1/16W
R264	1-216-833-11	METAL CHIP	10K	5%	1/16W
R265	1-216-817-11	METAL CHIP	470	5%	1/16W
R266	1-216-800-11	METAL GLAZE	18	5%	1/16W
R267	1-216-800-11	METAL GLAZE	18	5%	1/16W
R268	1-216-800-11	METAL GLAZE	18	5%	1/16W
R269	1-216-835-11	METAL CHIP	15K	5%	1/16W
R270	1-216-835-11	METAL CHIP	15K	5%	1/16W
R271	1-216-813-11	METAL CHIP	220	5%	1/16W
R272	1-216-805-11	METAL CHIP	47	5%	1/16W
R273	1-216-813-11	METAL CHIP	220	5%	1/16W
R280	1-216-835-11	METAL CHIP	15K	5%	1/16W
R281	1-216-835-11	METAL CHIP	15K	5%	1/16W
R282	1-216-813-11	METAL CHIP	220	5%	1/16W
R283	1-216-805-11	METAL CHIP	47	5%	1/16W
R284	1-216-817-11	METAL CHIP	470	5%	1/16W
R285	1-216-821-11	METAL CHIP	1K	5%	1/16W
R286	1-216-821-11	METAL CHIP	1K	5%	1/16W
R287	1-216-805-11	METAL CHIP	47	5%	1/16W
R288	1-216-809-11	METAL CHIP	100	5%	1/16W
R289	1-216-817-11	METAL CHIP	470	5%	1/16W
R290	1-216-797-11	METAL CHIP	10	5%	1/16W
R291	1-216-817-11	METAL CHIP	470	5%	1/16W

Ref. No.	Part No.	Description			Remark
R292	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R293	1-216-833-11	METAL CHIP	10K	5%	1/16W
R294	1-216-813-11	METAL CHIP	220	5%	1/16W
R295	1-216-797-11	METAL CHIP	10	5%	1/16W
R296	1-216-813-11	METAL CHIP	220	5%	1/16W
R297	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R298	1-216-833-11	METAL CHIP	10K	5%	1/16W
R299	1-216-813-11	METAL CHIP	220	5%	1/16W
R300	1-216-797-11	METAL CHIP	10	5%	1/16W
R301	1-216-813-11	METAL CHIP	220	5%	1/16W
R309	1-216-833-11	METAL CHIP	10K	5%	1/16W
R310	1-216-797-11	METAL CHIP	10	5%	1/16W
R311	1-216-821-11	METAL CHIP	1K	5%	1/16W
R312	1-216-837-11	METAL CHIP	22K	5%	1/16W
R313	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R314	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R315	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R316	1-216-809-11	METAL CHIP	100	5%	1/16W
R317	1-216-835-11	METAL CHIP	15K	5%	1/16W
R318	1-216-833-11	METAL CHIP	10K	5%	1/16W
R319	1-216-821-11	METAL CHIP	1K	5%	1/16W
R320	1-216-833-11	METAL CHIP	10K	5%	1/16W
R321	1-216-821-11	METAL CHIP	1K	5%	1/16W
R322	1-216-809-11	METAL CHIP	100	5%	1/16W
R330	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R331	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R332	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R333	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R334	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R335	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R336	1-216-797-11	METAL CHIP	10	5%	1/16W
R337	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R338	1-216-857-11	METAL CHIP	1M	5%	1/16W
R339	1-216-797-11	METAL CHIP	10	5%	1/16W
R340	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R341	1-216-821-11	METAL CHIP	1K	5%	1/16W
R342	1-216-825-11	METAL CHIP	2.2K	5%	1/16W

< OSCILLATOR >

SAW201	1-579-451-11	OSCILLATOR, SURFACE WAVE
TCX0201	1-466-551-11	OSCILCATION UNIT, CRYSTAL (18.414MHz)

Ref. No.	Part No.	Description	Remark
		MISCELLANEOUS	
		*************	
74	1-809-398-11	DISPLAY PANEL, LIQUID CRYSTAL	
ANT201	1-501-506-21	ANTENNA	
BATT101	⚠1-528-229-31	BATTERY, LITHIUM (CR-2450)	
CNC101	1-590-947-11	CABLE (WITH CONNECTOR)	
CNC20	590-948-11	CABLE (WITH CONNECTOR) (RF)	
CNC30	1-590-946-11	CABLE (WITH CONNECTOR)	

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ACCESSORIES & PACKING MATERIALS
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	1-590-946-21	CABLE (WITH CONNECTOR) (7m)
	1-690-165-11	CORD, CAR BATTERY (DCC-360P)
⚠	1-690-166-11	CORD (DCC-360S) (WITH Cigarette Lighter Socket)
	3-333-744-01	SHEET, PROTECTION
	3-369-830-01	STAND
	3-369-832-01	BELT, CARRYING
	3-369-972-01	CASE, CARRYING
*	3-372-287-01	INDIVIDUAL CARTON (E)
*	3-373-578-01	INDIVIDUAL CARTON (US, AEP)
	3-753-461-11	MANUAL, INSTRUCTION (FRENCH) (AEP)
	3-753-461-21	MANUAL, INSTRUCTION (ENGLISH) (US)
	3-753-461-31	MANUAL, INSTRUCTION (ENGLISH) (AEP, E)
	3-753-461-41	MANUAL, INSTRUCTION (GERMAN) (AEP)
	3-753-461-51	MANUAL, INSTRUCTION (SPANISH) (AEP)
	3-753-461-61	MANUAL, INSTRUCTION (ITALIAN) (AEP)
*	3-899-566-01	CUSHION (B) (Stick on Carrying Case)
	X-3363-284-1	SCREW ASSY, ANNEX (8pieces of bracket installation screw)

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	**Note:** Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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